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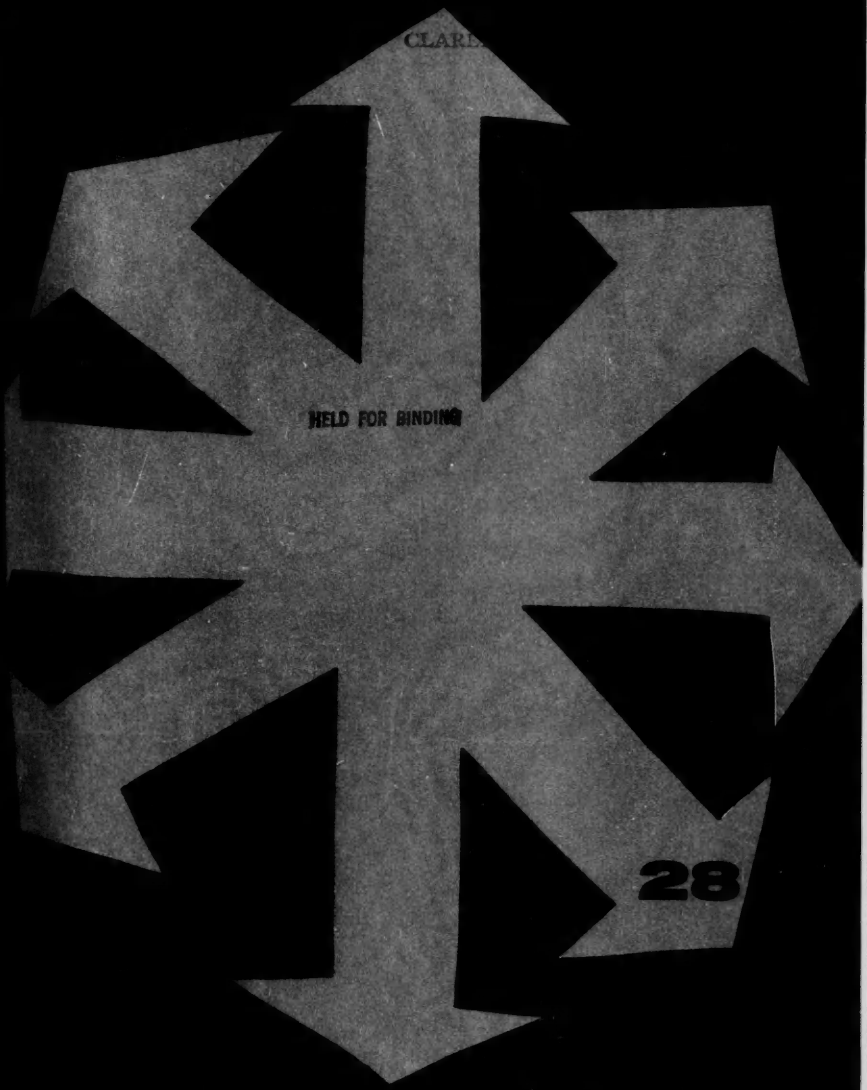

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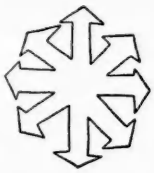

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NOTES AND DISCUSSION

José Ortega y Gasset

THE DIFFICULTY OF READING[1]

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To read, to read a book, is, like all the other really human occupations, a utopian task. I call "utopian" every action whose initial intention cannot be fulfilled in the development of its activity and which has to be satisfied with approximations essentially contradictory to the purpose which had started it. Thus "to read" begins by signifying the project of understanding a text fully. Now this is impossible. It is only possible with a great effort to extract a more or less important portion of what the text has tried to say, communicate, make known; but there will always remain an "illegible" residue. It is, on the other hand, probable that, while we are making this effort, we may *read,* at the same time, into the text; that is, we may understand things which the author has not "meant" to say, and, nevertheless, he has "said" them; he has pre-

Translated by Clarence E. Parmenter.

1. [*Diogenes* having expressed the desire to publish an unedited text of José Ortega y Gasset, his heirs have sent us the following pages which form the beginning of a rough draft destined to be entitled "Commentary on the *Symposium* of Plato." It consists of a body of notes which have been prepared not for publication but to accompany the reading of the text of Plato during a university seminar. Although neither finished nor in shape for publication, the first part, which we present here, the only one which is assembled, adds interesting elements to the author's doctrine on linguistics and ontology.]

sented them to us involuntarily—even more, against his professed purpose. This twofold condition of speech, so strange and antithetical, appears in two principles of my "Axioms for a New Philology," which are as follows:

1. Every utterance is deficient—it says less than it wishes to say.
2. Every utterance is exuberant—it conveys more than it plans.[2]

But this last, this unpremeditated gift with which the exuberance of speech provides us, does not compensate for its essential deficiency and does not make the operation of reading more successful, if by reading we mean merely understanding what the author *wished* to say. But precisely the fact that we very soon notice that a good part of what the author actually is saying escapes us—for example, the somewhat precise signification of this or that word—reveals to us that reading cannot consist solely of simply receiving whatever the written phrases pour over us, that reading is not merely sliding over the text, but that it is necessary to extricate ourselves from the text, to abandon our passivity and construct laboriously for ourselves all the mental reality not *expressed* in it, but which is indispensable in order to understand it more satisfactorily. Then we are thankful for the results of all those supererogatory investigations which we had discovered as if behind the phrases read and which the author did not intend to communicate to us or even intended to conceal from us. The result of this is that *every* text appears to us as a mere fragment of a whole *X* which it is necessary to reconstruct.

This may seem strange, but it cannot appear questionable; in order to understand what someone wished to say (meant), we need to know much more than he wished to say and to know about the author much more than he himself knew. Therefore Kant was only too right when he demanded that one should understand Plato better than Plato understood himself.

This work is laborious; it requires diverse techniques and very complicated theories, some general, others particular, which we shall gradually encounter in our reading of the *Symposium*. The ensemble of these efforts, some technical, others the result of spontaneous perspicacity, is called "interpretation," and the art of it, "hermeneutics." Reading is not, then, an indefinite thing. Every reality has to be defined ac-

2. See in my book in preparation, *Velázquez*, chap. i, "The Resuscitation of Pictures," which will soon appear (collected in the volume *Papeles sobre Velázquez y Goya*). See also on this theme chaps. xi and xii of *El Hombre y la gente*.

cording to its complete form, of which all the others are deficient modes. In this sense, to read is to interpret and not anything else. This is not, therefore, an easy task, to understand what someone has wished to say!

To speak is one of the things that man does, and speech gushes out as reactive behavior in response to a situation. This situation may be instaneaneous, lasting, permanent in a man or constant in man, in "humanity." Humanity is the name of a situation which has lasted for approximately a million years.[3] If we represent these diverse coefficients of "perduration" of situations in the form of areas, we see how each situation is inscribed in a larger one which carries and excites it, except the "constant" humanity which serves as something absolute in relation to all the rest. These areas or strata of situation form, therefore, an organic hierarchy so that the more transitory situations suppose the more stagnant and are based upon them.

The fact that we understand today the *Geometry* of Euclid—until recently it was a textbook in English colleges—does not indicate that the language of Euclid, because it is mathematical, *always* has meaning, and not only with reference to a single situation, but rather that certain components of our present situation continue to be the same which formed part of the situation in which Euclid lived and which induced him to say what he said about geometry. Homer, who with a little effort would have been able to comprehend the language of Euclid, would not, however, have understood any phrase of the work because he was ignorant of the situation from which all those statements issued. In fact, only he "who is in the secret" that one of the occupations to which Man may devote himself is that very refined one which is called "making science, theory" can find the meaning of the statements of Euclid. Homer, on seeing those figures of triangles and polygons, would have believed that the subject matter was magical conjurations or, if not that, games to amuse children, because both situations—the one which leads to the practice of magic and the one which leads to play—were certainly known to him. Before understanding any concrete statement, it is necessary to perceive clearly "what it is all about" in this statement and "what game is being played." This last expression is less capricious or "literary" than the reader has at first supposed. For, as we shall see, Plato was much more right than he suspected when he qualified human

3. The philosophical concept of "situation" as a constitutive ingredient of human life already appears in Auguste Comte (see, e.g., *Discours sur l'esprit positif*).

life as essentially a game—*paidiá*.[4] If man had a "nature," a fixed existence such as mineral, vegetable, and animal have, we could know once for all what his behavior signified, but, as this is not true, man in each epoch devotes his life to different ends and always more or less new ones—ends which he himself has invented and which are the "convention" or *tacit assumption* of his actuations and occupations. These only have meaning in relation to that very free convention. That, then, is the definition of the game—the "conventional" occupation par excellence.[5] And, vice versa, the daily fact that we are unable to understand a book without previously reconstructing the *conventional situation* in which it was written is, in its turn, an unceasing proof of the playful character which through one of its faces human life exhibits.

Man needs to "say"—let us not now enter into the investigation of why—and, in order to serve this necessity, he possesses some means. The principal organ or means of saying is language. It is far from being the only one. Let us not embark, either, on suggesting what the others are. Instead let us make it clear that linguists have an *a limine* insufficient notion of language—for various reasons, all of them so simple that they fall short of evident truth. The first is that linguists contemplate languages "already developed" and observe the modifications which are produced in them in the course of time. This has permitted them to elaborate the most perfect science of all those which treat of the humanities. But present-day linguistic science is a macroscopic theory. If there is to be real progress in it, it must shift to the microscopic.[6] For this it will be necessary to scrutinize the reality "language" in its radical profundity, and for this, in turn, it is indispensable not only to take languages as they are "already developed" but to succeed in seeing language *in statu nascendi* or, in other words, to represent the conditions of the possibility of something like language.[7] Then it will be seen—and this is evident—that the most powerful condition for anyone to succeed in saying something is that he be capable of observing profound silence about everything else. Only a being capable of renunciation, of

4. *Laws* 803C.

5. See J. Huizinga, *Homo ludens.*

6. At various points at the same time, unconnected to each other, a prodigiously microscopic tendency is now penetrating this level. Such are linguistic geography, the study of language from dialects, *patois, argots,* languages of professional groups, stylistics, etc.

7. The subject, then, has nothing to do with the problem of the origin of language.

the asceticism which takes for granted the omission of speaking of many things which it would like to communicate in order to succeed thus in saying even one, can arrive at forming a language. If man had persisted in saying (therefore, naming) the shade of white of this paper as distinguished from the white of the other white papers, language would not have been created, because it would have overflowed into infinities. For this reason no language in the world has a word to designate the shade of this paper—that is, of something which we see with complete clarity and might very well wish to express. The chromatic shade is ineffable. The common idea that something is ineffable because it is complicated, sublime, or divine is erroneous. Ineffability has many dimensions—some, in fact, extreme and pathetic, but others, like the one referred to, edifyingly trivial. Language in its authentic reality is born and lives and is like a perpetual combat and compromise between the desire to speak and the necessity of silence. Silence, ineffability, is a positive and intrinsic factor of language. Each society practices a different selection from the enormous mass of what might be said in order to succeed in saying some things, and this selection creates the organism which is language. Let it be recorded, then, that language from the beginning is an amputation of saying. I do not believe that it would be difficult, by transposing graphically this conception of language, to sketch its contours in such a way that, upon superposing them, one could observe with complete clarity their coincidence and divergencies in declaring and in being silent. Each one is modeled by a different selective spirit which acts upon the vocabulary, on the morphology, on the syntax, on the structure of the phrase and period.

It is surprising that a master as exemplary as Meillet would say: "Every language expresses whatever the society of which it is the organ needs. A language of semicivilized people will not be capable of expressing philosophical theories, but this does not result from its linguistic structure. With any phonetic system, with any grammar, anything can be expressed."[8] This is not a good occasion for complete discussion of this thesis, which is an example of the ineradicable optimism installed in scientific thought since the latter burst into flight in Greece. The formula "everything that a society needs" is too uncompromising, but even so we wonder with what gauge Meillet measures and determines

8. *Bulletin de la Société Française de Philosophie*, discussion of November 22, 1922.

the necessities of a society. We suspect that a tautology is hidden in his words and that he confuses the necessities which a society has with those which satisfy and the reality of a language with what would be a language which was fully satisfactory, that is, perfect.[9] Such an excessive affirmation as the end of the paragraph quoted above could rightfully be made only by a person who has not been satisfied with observing the linguistic facts and the *result* which are the languages but who, in the face of all these realities of speech, has kept in view the possibilities of that function and has started from them in order to form for himself a radical notion of language.[10]

Language consists, then, of a previous retraction and, as it were, asceticism of speaking which accompanies all its beginning, its organization, and its development, since it is clear that language is never made (finished) but that it is always making itself—I mean, being born. This *fieri* of the reality "language" consists not of the superficial modifications—although important—which the linguist investigates and tries to reduce almost to laws, but of the changes in the profound tendencies which engender enormous phenomena like, for example, the one which led Meillet himself to write a study entitled "Can the English Language Be Considered as an Indo-European Language?"

We may summarize this first condition of language by saying: *Language is always limited (bounded) by a frontier of ineffability.* This limitation is constituted by that which absolutely *cannot be said* in a language or in any language.

But on top of this there is a second limitation, that is, all that which

9. Note that this optimism—whose meaning and origin we are going to detect in this commentary on the *Symposium*—is not linguistic only. Because language is a typical function of society, it means that the latter is a reality normally perfect, since it satisfies its necessities sufficiently. There is, then, an underlying sociological optimism. This ingenuous belief that what exists simply because it exists has to be perfect comes to us from Plato by way of the Scholastic aqueducts. In the words of Meillet, it is taken for granted that a civilized people is capable of expressing its philosophical theories, which is a pious illusion.

10. It is the most substantial difference between the thinking of today and that of a half-century ago, which was still "positivistic." The latter was being set up, suddenly, in the realities (the famous "facts"); present-day sciences, however, especially the physical sciences, in the face of a problem begin by constructing the system of its possibilities and only afterward arrange the facts in that formal quadricle. He who sees the reality of a subject cannot see its shape, because he lacks a background against which its silhouette may stand out—that is, its *form*. This background is the map of the possibilities (and of course impossibilities). Real language can only be investigated fundamentally on the basis of possible-impossible language.

the language *could* say but which every language passes over in silence because it expects that the hearer can and should himself suppose it or add it. This silence is on a different level from the first: it is not absolute but relative; it proceeds not from fatal ineffability but from a conscious economy. As opposed to the ineffable (unspeakable), I call this conscious reticence of language the unspoken (*inefado*). Here we can save explanations by quoting a few words of Wilhelm von Humboldt, who perhaps has had the greatest sensitivity to the reality of "language":

> In the grammar of every language there is a part that is expressly signified and another which remains tacit which has to be added [*stillschweigend hinzugedachter Theil*]. In the Chinese language, that first part is found in an infinitely small proportion in relation to this second part. . . . In every language, the context of the elocution has to come to the assistance of the grammar. In Chinese that context is the basis for comprehension, and frequently the only way to derive the construction is from it [the syntax]. Even the verb reveals itself only in the concept of the noun. . . . The Chinese language, thanks to the strange phenomenon of this pure and simple *renunciation* of an advantage common to the other languages, brings about that the relations and oppositions among the ideas appear clearer in it than in any other language.[11]

Here we have, then, a second stratum of limitation in the expression of a language. It is curious that linguists frequently fail to perceive this, and the fact that in speaking a language one understands or communicates what the language leaves unspoken prevents their noticing that the language does not say it. In general, I do not see that sufficient distinction is made between what the language says and what we say "with it."

But there is a third reason which makes evident to us how far linguistics is from having a full intuition of what language is. The most primitive peoples cannot understand each other with their own language alone but need the complement of gesticulation. For this reason they cannot talk in the dark. Frobenius has called attention to the fact that the natives of Nigeria do not understand well the European who speaks their language well, for the simple reason that he gesticulates much less than they do.[12]

11. Wilhelm von Humboldt, *Werke*, V, 319. Quoted in Stenzel, *Filosofía del lenguaje* (Madrid: Revista de Occidente, 1935). For example, imagine a sentence composed only of nouns in which, for example, by the word "race" we had to understand the idea "he ran," together with all the other modes, tenses, numbers, and persons of the verb "to run."

12. Still in New York (Harlem) the Negro preacher who preaches the Palm Sunday sermon, when he says that Jesus mounted upon a young she-ass to enter Jerusalem, places

This leads us to note that, if linguists understand by "to speak" to make use of a language, they are committing a grave error, because language as speech is not in fact articulation only but is completed by the modulations of the voice, the expression of the face, the gesticulation of the members, and the total somatic posture of the person. Therefore, the language of the linguist is only a fragment of language insofar as it means "to speak." And this does not mean that he should busy himself with that which he left out, but it does mean that, in view of it, he should treat language seriously as a fragmentary reality and not as an *integrum*.[13]

himself astride the pulpit. "In Loango every one moves his tongue in his own fashion or—better, the language comes out of the mouth of each one according to the circumstances and the disposition in which he is. This use of language is—I do not think of a better comparison—as free and natural as the sounds emitted by birds" (Peschnel-Loesche, *Die Loango-Expedition*, III, 91–95). In other terms, the words are not something rigid and fixed once and for all, but the buccal gesture discloses, sketches, and expresses graphically, in the same way as the gesture of the hands (Lévy-Bruhl, *Les Fonctions mentales dans les sociétés inférieures* [Paris: Alcan, 1910], pp. 182 and 186). Let it be added to this that many primitive languages consist not solely of words but also of fixed gestures of direct and formal grammatical signification. They are languages which, therefore, *cannot* be written, at least in the sense in which the classical languages and ours are written. "The fact that gestures have not been studied does not prevent us from being forced to recognize that certain apparent obscurities of the written language would not be obscure in the spoken language" (L. Homburger, *Les Langues négro-africains* [Paris: Payot, 1941], p. 64).

Many years ago I said that if English and Spanish adults are, at least among Occidentals, the men who have the greatest difficulty in learning foreign languages, it is because their feeling of personal dignity is more overdeveloped than that of others, although both for different and in part antagonistic reasons. The bond between these two phenomena, apparently so far apart, is that, in learning another language, if it is not in childhood, one has to act imitatively, abandon one's own personality, and "play" at being the German or the Frenchman, etc. Imitation, in adults, implies indefectibly a certain amount of histrionism, farce, and clowning, which, of course, is resisted by two peoples so terribly serious as these two, so incapable of transmigrating from their own *ethos* to the foreign one, finding it so difficult to be anything but themselves. Now this would not be the case if language were only pronunciation—movements technically useful for their end—and not, as happens, effective gesticulation—expressive movements which emanate lyrically from our personality which has been forming itself since infancy in the collective mold of our nation. In a word, the Englishman and the Spaniard are ashamed to speak other languages. It is for this reason that a language is in truth most radically an *idio-ma*.

13. This is what I should chiefly have to oppose to this opinion of Vendryès: "Whatever may be the variations of intonation and gesture which the same phrase undergoes, the linguist may disregard them if they do not modify the grammatical structure of the phrase."

Macroscopic grammar, perhaps, might think thus, but present-day grammar, let it not be forgotten, already has, in addition to others less highly developed, a new dimension—stylistics—which investigates finer "modifications in the grammatical structure of the phrase" which in many cases originate in intonation and gesture.

Although, as I have indicated, this is not the proper time for us to go deeply into a theory of language, let us take advantage of the scrutiny which the previous observation offers us. It, in fact, reveals to us that, in its root and authentic being, language is a gesticulation with sonorous effects, because the laryngeal and buccal organs intervene, but that it is really inseparable from the total gesticulation in which our whole body takes part and which is what strictly should be called "talk." To cut language out of this magnificent expressive complex is justified because the verbal gesture results in sonorous signs—words—which are relatively fixed and to which are ascribed relatively precise and abstract meanings. This makes it possible to compare it with the other types of gestures,[14] and, thus artificially isolated, a first elaboration of grammar would be possible. But this grammar should always keep alive the consciousness that its work, of course eminent and illustrious, began with a crime: cleaving the expressive integrity of man and leaving behind unheeded the root of language or language in its root and ultimate reality—that is, what it has of gesture or, better still, in a partial way, in the general gesticulation which human flesh is.

The most superficial examination of the evolution of grammar should have led to this warning. Grammar begins by analyzing the verbal phenomenon insofar as this is a heard[15] word. For millenniums this

14. The clear notion of what are the specific characteristics of language as compared to the other signs or symbols of expression will be found, *for the first time,* in the eminent book of Karl Bühler, *Sprachtheorie* (Karl Bühler, *Teoría del lenguaje* [Madrid: Revista de Occidente, 1950]). Bühler, however, limits himself to bringing out the "significative" character of verbality, which is, in fact, what constitutes the part of speech *sensu stricto* that language possesses. In this way he succeeds, marvelously in my judgment, in creating a discipline which rigorously deserves to be called "theory of language" and represents a level of consideration more elevated and abstract not only than a particular grammar but than general linguistics. But automatically it omits the radical reality of langauge or *speech* which can be contemplated only on an ultimate level, that is, "philosophical." (See on this *radical reality* of language the author's ***El Hombre y la gente,*** chaps. xi and xii.)

15. Nor even this with sufficient purity. Grammar is a theory which, like all theories, was born of a need—more precisely, of a *new* need originating in the invention of a new technique: writing. This pleasant idea—of representing the heard words with visual signs and of bringing to pass deliberately that a world of visualities should function as a *symbol* of a world of auditions—has a development with an inspiring history, as every great technique always has. In the development and progressive perfecting, a critical point was reached which required a new technical idea, opposed to the initial one, which fortunately transcends and negates the initial one: the substitution of the alphabet for the ideogram. But this was impossible if the complex sounds which words are were not first analyzed in order to discover in them primary sounds which are repeated in them. Probably this caused the discovery of the idea of "element" which was to be so infinitely fertile in the whole field

first grammar did not take a single essentially new step forward until, in the nineteenth century, it learned to become sufficiently humble to notice this very trivial fact: that the word, before being a sound and being heard, has to be pronounced and that it is therefore first a muscular movement—laryngeal, buccal, and nasal. When the verbal sound was traced back to its genesis as a system of articulatory muscular habits, phonetics was born and, with it, the prodigious rigor of the new grammar.[16] But in this idea of language as muscular activity the ancient idea of language as audition continued to be *too* active. In fact, phonetics starts with the idea that the speaker executes his movements of pronunciation guided by an eagerness to produce an ideal of sound—the word just as he has heard it. And there is no doubt that this cycle of "audition—approximate pronunciation—new sound" acts permanently in the language "already formed." But in the radical *fieri* to which I was referring before and which operates not only in the utopian origin but also in the great lines of its development—therefore, at all times—the decisive thing is not the auditive ideal of the word which exists but the pure intimate preference of the speaker for certain movements of the chest, larynx, mouth, and nasal passages. And this preference—spontaneous, unconscious, lyric—is not a movement toward the end of emitting a definite sound which issues from the human body without a useful end—the condition of the expressive gesture. The result of this is that phonetics must again be taken back to a function previous to pronunciation itself, that is, to gesticulation, and language must be studied in its root as pure gesture.

What do I mean by this? Nothing vague. It originates in an observa-

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of the human mind. To the elemental sound was assigned an elemental symbol: the letter—*gramma*—and, lo, grammar is invented. Having originated during the invention of writing, grammar abandons its primary attention to the ***heard*** word and consists more and more, until the nineteenth century, of a consideration of the ***written*** word. Not in vain is it called "grammar"—and not *logática* or *epeática*, which is what a linguistics would have been which was chiefly concerned with audition and even one which might have resulted from ideographic writing. So much for the origin. In regard to its first organization into a body of doctrine, the principal labor was due to the necessity of studying the Homeric text in a form which facilitated its transmission to educated boys. The text was unintelligible because of its archaism and conventionality.

16. An exceedingly ingenious and interesting attempt to return to the auditive theme is the discipline which, as opposed to phonetics, has been called "phonology," initiated a few years before the war by Prince Trubetzkoy in the school of Prague. It would not be useful to our subject for us to attempt here a brief explanation of the phonological point of view.

tion motivated—or which should have been motivated—by the necessity of facilitating the teaching of foreign languages. If you want someone to learn to speak English well, the first thing to tell him, before teaching him a single "English" word, is to amuse himself from time to time by speaking his own language with the lower jaw thrust forward as if it were slightly heavy. This automatically brings about a great reduction in the movement of the lips, and almost all activity is forced upon the tongue, larynx, and nasal cavities. English phonetics emanates entirely from a certain posture of the face. This posture is the normal gesture of the Englishman, and, like every gesture, it expresses something involuntarily, and what this gesture expresses is plainly and simply the basic and lasting way the insular Anglo-Saxon confronts life. Let us suppose that one is trying to teach French. We should instruct the student to advance both lips as if to kiss, as if two people were kissing each other to their mutual delight. Such is the expressive gesture of a man for whom to live is to sip the world like a cordial and then to smack his lips, autocritical, underscorer of himself: it is the Frenchman.

It is not enough, therefore, to recognize that in a certain place the people when they speak move their lips with maximum frequency in a certain manner, press the tongue against certain regions of the buccal cavity, and send the vibratile air against the nasal cavities so that it may resound in them. It is also necessary to make formally explicit the character of pure preferences which all this has. The people of every nation relish living in precisely those movements of their muscles and not in others, as is the case with the rest of their gesticulations. Now the strange phenomenon of the expressive gesture has not been explained except by admitting that its function is to mimic symbolically our imaginary behaviors. The furious man who pounds the table with his fist symbolically smashes someone of whom the patient table is the unforeseen representative.

My idea is, then, that the articulatory moment of language is secondary in respect to the gesticulatory and that the gestures with which a language is pronounced symbolize the ways of human life which a nation prefers.[17]

17. This idea is beginning to find experimental confirmation. Dr. Oscar Russell and R. A. S. Paget have demonstrated that the larynx and neighboring cavities change their "expression" when "the expressive gesture of the face changes" (see *International Congress of Phonetic Sciences* [Amsterdam, 1932] and *Psychology of Language* [Paris: Alcan, 1933], p. 99). Elsewhere Sievers has given evidence of a different intonation when the same word is used in the nominative and in the accusative.

This is what I wish to suggest when I say that language is, first, gesture. If it were urgent to be complete here and expose all my thoughts on this theme, I would have to add that, while a definite style of gesture is characteristic of each language, so also originally was a definite melody. But it is not necessary to become involved in this new question now. Gesture, melody, and therefore lyricism—this, first of all, is what speech is, because this is what language or idiom is. It is not surprising, since lyricism is and has to be the principal thing in man, who is a tremendous lyrical animal.[18]

Let us recall where all this is leading. We started from language or speech as the principal means, if not the only one, upon which man depends for expression. But language as language *sensu strictu* is *a nativitate* limited by the necessity of being silent about many things because of ineffability. To this limitation language adds a second one, leaving many indispensable things unsaid, which it is hoped the listener will add himself: this is the unspoken. Finally, language *sensu strictu* is a mere fragment of human expressivity; it is the disintegration of gesticulatory life, with which we arrive at a third limitation. Let us now dispense with euphemism and declare that language essentially, and not by accidental cause, suffers from these three defects or deficiencies; that language does not attain its end with sufficiency and therefore is a badly constituted reality in and of itself. But all this, in turn, was to the purpose that if to read is to understand the meaning of a text, and that if the means of saying it—language—is already in itself imperfect, it should not be surprising that reading always turns out to be a problematical operation.

The difficulty increases in grave proportions if we pass from the abstract contemplation of the limitations of the instrument with which we express—language—to the inspection of the concrete expression and, especially, the text, the book.

The book is a fixed expression, "petrified"; it is, rigorously, something which has been said. But authentic speech, as we indicated at the beginning, is that which issues from a situation as a reaction to it. Removed from its original situation, what is said is only half of itself. In fact, the fundamental speaking is the dialogue or group conversation in which the interlocutors are in each other's presence and entirely submerged in a definite physical, moral, mental, and, in a word, vital situation. This

18. The "why" of all this, which sounds so like a phrase, is not to be explained here.

situation is evident to all, and what they say takes it for granted and does not express it because it is known; it is passed over in silence, and the talk devotes itself to enunciating precisely that which is not evident, what the situation leads up to but is not in itself.

The unit or "cell" of speech is the sentence. The sentence is composed of words, that is, the words are pieces from which the machine of the sentence is put together. They alone, isolated, do not function; they are not machines, as the pieces of a machine are not machines. This suggests that the isolated word does not properly have a meaning.[19] If from the sentence, "The lion is the king of the desert," we separate the word "lion" and leave it isolated or disengaged, it loses all signification and is only a point of departure for innumerable possible significations. We do not know whether this solitary "lion" is the wild beast of the African steppe, or the café "Golden Lion," or Leo XIII, or Leo the Hebrew, or "Leon and Castile." It becomes charged with meaning only when we refer it to the sentence as a whole, when it acts *within the verbal contour* which is the sentence. I do not know whether all words are in fact equivocal, but the investigation would not be important because it is unquestionable that all of them can be equivocal.[20] The sentence, in turn, is likely to be ambiguous; since it is the basis for possible diverse meanings, it therefore also does not *have* in truth *one* meaning. It demands that we refer it to the rest of the text, the page, the chapter,

19. The question of whether it is the sentence which precedes the word or vice versa brings up innumerable questions which cannot even be touched upon here. What I say above tries to express only something which no one disputes: that the sentence is the *central* form of language, to which all the rest lead or from which all the rest descend.

20. The phenomenon of ambiguity, or mutiplicity of meanings of words, is a good example from which to realize the necessity for a discipline which may study languages on a level more profound (or more elevated) than the linguistic level. This reveals, as the most natural thing in the world, that this fact is true of all languages. But what would indeed be natural, then, is that linguistics should take another step and should consider the phenomenon as a constitutive character of languge which would be the equivalent of recognizing in language a new consubstantial defect. But in this case it would be obliged to explain this congenital infirmity of language by causes also constitutive, and the least it could do is try to derive it from the change in meaning which happens to words. But, with the phenomenon of change of meaning, linguistics acts in the same manner. It declares the normality of its presence in all languages; but, when it arranges its facts and explains them, it treats them as though they were mere accidents which happen to words, just as an automobile accident could happen to a linguist.

Read, to refer to a masterly work, the chapter (xii) entitled "Wandel der Wortbedeutung" ("Change of Meaning") which Hermann Paul dedicates to the subject in his *Prinzipien der Sprachgeschichte*, a book truly enchanting, in addition to being magnificent as a work of science.

and, finally, the book. The sentence likewise does not ***function,*** nor is it what it is without a contour around it. This contiguous contour of a word, of a sentence, of a text, is the context. The context is a dynamic whole on which each part exercises influence, modifies the others, and, vice versa, receives pressures from the others. This is trivial. The opposite consideration is more interesting; that the context is, in fact, a ***contour,*** the most contiguous to the word, the only contour of it evident to the reader. It is a contour entirely verbal and nothing more, which permits us, nevertheless, to give to the word a meaning with first approximation. And what concerns us in this is to formulate the warning emphasizing at once how the word, when it functions and ***says*** something, does it in reference to a contour, which for the present is a mere context of other words. From its poorest signification, but already effective, active—and not inert, dissected, as it is in the dictionary—it consists, then, of an actuation on and in its contour. This means that ***the contour forms a part of the word and that the word is activity,*** pure dynamism, pressure of a contour on it and of it on a contour.

But the entire context, the whole book, in turn is "equivocal," and this "ambiguity" of its entirety reacts on every one of its words. The works of Plato are a great example, we might almost say a scandalous example, of it. Because, in spite of their having been studied and commented upon in works which weigh an enormous number of tons, we have no clear and firm idea of what these writings are, "what these pages are really all about," and "what game is being played in them." Also we do not know whether they are written seriously or in jest or in a mixture of both. And this leads us to say that, in regard to innumerable sentences of Plato—literally, in respect to the major number—we do not know whether Plato really believed them or whether they were pure sport. ***In a word, we do not understand Plato.*** And this happens with the author who has had the greatest influence on occidental life! Now it will be understood why it is not capricious to initiate a reading of Plato's *Symposium* by inviting reflection upon how devilish is this task of reading, which can so easily consist of ***not*** understanding what one is reading about.

The absence of the speaker leaves with us the written word disconnected from the expressive complex which was the body of it. No matter how accustomed we may be to reading, the better we know how to read, the more we shall feel the spectral sadness of the written word without a voice to fill it, without carnal mimicry to incorporate it and

make it concrete. Goethe was right when he said that the written word is a substitute, a miserable *Ersatz,* of the spoken word. It is not importunate to allude to this at the beginning of a lesson on the *Symposium,* because in the similar and contemporary work, the *Phaedrus,* Plato will make evident his antipathy to all books because of their content of cadaverous language and paralytic expression. And he insinuates most sharply something which is not usually noted: that the relation between the reader and the book is immoral, for neither can the book answer our objections but continues insolently and without risk saying always the same thing, nor can it energetically answer the imbecile reader by giving him—and this Plato does not say, but we can read it between the lines—a good blow on the nose. Dulled by the habituality of reading which is now almost second nature to us, we enjoy the evident advantages of the written word—the printed, in fact—and we have lost consciousness of the wastes and dangers which it brings with it. It has created in the last sixty years a growing undervaluation for the only word which is a word in its plenitude, the oral word, and of the most human marvels of all, which are dialogue, oratory, and rhetoric—the only true magic.[21]

Now this paradox manifests itself: one may say with a good deal of motivation that Plato is precisely the first "writer of books" who exists in Greece. The work of Thucydides had not yet been "published" when Plato began to write.[22] Some "private" copies of Herodotus would be in existence. The book as an industrial and "public" entity had been invented a short time before, toward the middle of the fifth century, and, curiously, in order to "publish" the most famous tragedies.[23] Plato is the

21. These themes will be discussed during the reading of the *Symposium,* where more than in any other writing of Plato the fiction of dialogues and the fiction of discourses are united. Among the evils which the domination of the book has brought, let us mention here only the most immediate and material: the diminution of the vocabulary, in spite of the fact that the invention of printing, coinciding with the high tide of humanism, dumped upon the Romance dictionaries its load of Latinisms.

22. Of course it is not a book of Thucydides but the work of Thucydides, the *ergon* of his life. It is not written in order to write; it is consubstantial with him.

23. Therefore, as in our seventeenth century, the "parts" of Lope de Vega were published and the collections of the "most famous comedies." It would seem that the dramatic work would have its maximum form of existence on the stage, and it would be less urgent than for any other production to give it another form of life in a book. In both cases, however, the contrary happened and this fact invites us to reflect upon the phenomenon, because it may perhaps put us on the track of what is the true (and problematical) condition of dramatic art.

first author who "makes" books, from whom books are expected—to such an extent that in the Academy itself there was established a "printing office"—an atelier of copyists to publish the works which he kept producing. What is more, about 374 B.C. Plato "published" the *Republic*. To my knowledge, only Wilamowitz[24] has noted—and even he could not have concealed his astonishment—the enormity which, at that date, the idea of writing a book of such gigantic proportions represented. This was not a collection of cantos—which is how the Homeric poems were seen and read—or a series of narrations largely independent, like the stories of Herodotus, but a tremendously bulky book made up entirely of opinions or ideas, forming an architecture of such size and so intricate that it could not be made clear or manageable for young readers, who must have felt shipwrecked in such an ocean of writing.[25] That is to say that this man, an enemy of books, not only wrote books but did it in the superlative, on a gigantic scale. Let us try from the start gradually to become accustomed to these contradictions in the figure of Plato, since we are going to encounter many of them. But "to become accustomed" means here the opposite of "to become insensitive to." It is a question of developing in ourselves the ability to be astonished and to be always alert when reading.

This contradiction, on the other hand, clarifies somewhat the no-less-strange fact that the Platonic writings always consist of dialogues which are supposed to have taken place or of speeches, it is pretended, which have been pronounced. It is understandable that one who does not believe much in the written word would try, when writing, to imitate as far as possible the spoken word.

It is necessary now to fix the attention solely on that aspect of the written word which makes it a deficient form of expression, leaving for another occasion the illustration of its excellent qualities. If Plato wrote volumes, let there be no doubt that it was not by chance or from incontinence but because, in spite of its congenital deficiency, the book is the only form in which it is possible to say certain things, which it would be useless to try to communicate even to the best friend in the closest of confidences.[26] But we find that the usual manner of considering lan-

24. Wilamowitz-Moellendorf, *Plato* (1919), I, 389.

25. Let us not speak of the *Laws* which Plato left unfinished and which is two-fifths larger than the *Republic*.

26. The relative impersonality and dehumanization of the written word, at the same time that it makes the elocution ghostlike, lends it a distance and anonymity, an "objectivity," which are indispensable for the transmission of, for example, theories.

guage does not take it in its integral reality but quarters the reality and retains only one of its members. These pages would like superficially to reintegrate, step by step in logical order, our conception of language, to show what its reality is; and this implies its integrity.

Now, for us, the book is the absence of the author, and the written word the previous flight of the one who pronounces it. We have a speech without a speaker present. Why do we emphasize this so much? Is it not an exaggeration to give so much importance to the gesticulatory complex in which the word has its primitive form? We do this, however, because others attribute too little importance to it. There is no doubt that, if we could see Plato in the flesh, merely seeing him and hearing him speak would solve for us automatically some of the great problems which the reading of his books raises and which, lacking his presence, will perhaps remain perpetually enigmatic.[27]

27. Therefore, the only thing we can do is to construct imaginatively the body of Plato, his carnal appearance, and, if we lack data which permit us to decide what shape he had, we shall be forced to imagine several different ones and to compare the different results which they give when placed behind his writings. Let no one grimace. This simply means using in history the hypothetical method which has permitted the forging of physics.

Charles Kerényi

BIRTH AND REBIRTH OF TRAGEDY: FROM THE ORIGIN OF ITALIAN OPERA TO THE ORIGIN OF GREEK TRAGEDY

There are two pitfalls which constantly threaten the literary historian who seeks the origins or beginnings of works of the mind such as species of literature or forms of religion, as well as the examples which partake of both. One danger is that the study may become an artificial construction without sufficient concrete basis in proved historical facts; the other is that the author may prefer experience to such constructions and may be too much influenced by what he has known and been impressed with as origin and beginning in his own time. The latter has at least one advantage: where there is no experience at the outset of an investigation, not even that minimum of *empeiria* which I shall call, with the Greek poet Alcman, *peira* (*peira toi mathesios archa,* "experience is the beginning of knowledge"), then there can be no scholarship

Translated by Edith Cooper.

in the fields of literature, art, and religion. In the history of those three fields we can be competently guided only by "veterans"—not mere theoreticians but men who in a sense are also "practitioners" in the creating of works of the mind. Experience takes first place not only in the natural sciences but also in modern scholarship in these areas, even with the risk that it may be too personal, too time-bound, too small in scope.

Nietzsche's book *The Birth of Tragedy* is an example of this, one which we cannot ignore here in regard both to method and to content. Two facts are true concerning this work, facts which, set down side by side, appear most paradoxical. The historical scholars of classical antiquity immediately exposed the weaknesses of the book, and yet it has remained the one German-language work in all of classical scholarship which has least lost its vividness and effectiveness to this day. This vividness it owes surely not to its theoretical foundation, the philosophy of Schopenhauer, but to the fact that it is also based on a true *experience:* on the experience of the new element introduced to that period by the operas of Wagner. This experience, plus the expression which a writer of the caliber of Nietzsche was able to give it, keeps alive this work of his youth. On the other hand, the limitation of the experience to something as accidental and personal as was Nietzsche's musical discovery robs it of its value for understanding the genesis of Athenian tragedy. Nevertheless, the attempt to understand the birth of a species of literature through analogy with one better defined remains in the realm of the concrete and is not limited primarily to artificial construction. Nor did Nietzsche exhaust the analogies between the history of the opera and the Greek art of tragedy. In the history of our European culture, which includes the history of music in Germany as well as Nietzsche's reaction to it, we find a parallel which in time, geography, and content lies closer to Greek tragedy than the works of Richard Wagner.

EXPERIENCING A BEGINNING IN THE HISTORY OF OPERA

Nietzsche believed that in his musical experience of the years around 1870, he had been witness to the "rebirth of tragedy." He used the term more than once, trying to point out the forces that seemed to him to prove such a rebirth and also the opposing forces, which he grouped together under the term "Socratic culture." He saw in Socrates the anti-

tragic philosopher. Opera for him epitomized antitragic art, and therefore he also called those same opposing forces the *"culture of the opera."* The italicizing is his and refers to pre-Wagner opera of Italian origin, with its "idyllic tendency." Nietzsche asks:

> Is it credible that this thoroughly externalized operatic music, incapable of devotion, could be received and cherished with enthusiastic favor, as a rebirth, as it were, of all true music, by the very age in which the ineffably sublime music of Palestrina had originated? And who, on the other hand, would think of making only the diversion-craving luxuriousness of those Florentine circles and the vanity of their dramatic singers responsible for the love of the opera which spread with such rapidity? That in the same age, even among the same people, it should awaken alongside the vaulted structure of Palestrine harmonies which the entire Christian Middle Ages had been building up, I can explain to myself only by a cooperating *extra-artistic tendency* in the essence of the recitative.[1]

Even if we wanted to adopt Nietzsche's opinion on what is and what is not art, we would have to acknowledge a gap here in the German philosopher's knowledge about the origins of Italian opera. It is our good fortune that we can base our studies on the work of one who was both a "veteran" and "practitioner" of intellectual creation and, moreover, a good historian in this field. Romain Rolland's work *Les Origines du théatre lyrique moderne: Histoire de l'opéra en Europe avant Lully et Scarlatti* (Paris, 1895) filled the gap with concrete content. The corresponding texts which had been available as little pamphlets were brought out by A. Solerti in a collection, *Gli Albori del melodramma,* published in Turin. For this is a characteristic trait of the early phases in the birth of the genre known as opera: poetic text and poet occupy first place; music and composer, second. Still, even in the very first phase, something new can be recognized clearly designating the beginnings of a birth after the preliminary phases in which it did not yet exist. We owe it to a text which Romain Rolland was the first to bring forward that the effect of such a beginning, and thereby a beginning itself, becomes vivid to us in all its concreteness. Only now does there seem to be a point to talking about the "birth of a species"—tragedy or opera—regardless of previous stages which would have represented a vain historical development of the species if a special act had not unexpectedly given rise to the new creation.

This decisive act could just as well have been called a "creative" act, except that we would then have to add that, by "creative," no quantita-

1. *The Birth of Tragedy,* trans. W. A. Haussmann (Edinburgh: Foulis, 1916), chap. xix, pp. 42–43.

tive distinction is intended, either in the sense of an accumulation of previous acts in the development or in the sense of an intensification. It would be better to talk about the simple act of one who *finds* (*heuretes* in Greek), an act which even in its uniqueness is distinguished by individuality. Every "find" has this characteristic which distinguishes it from all other finds: it is a single occurrence, and it is individual. Such individuality also characterizes the find which designates the first phase in the birth of the species "opera" and separates it from everything which preceded it: from the works which Romain Rolland has characterized in a later study under the title "L'Opéra avant l'opéra" in the volume *Musiciens d'autrefois* (Paris, 1908). We cannot imagine anything more individual than this deliberate junction with Greek tragedy in Florence at the end of the sixteenth century, in which, moreover, a mistake played a decisive role.

There we find ourselves not in an abstract history of music, construed with the aid of music preserved by notation, but in the midst of a concrete event, of which more than just written music, even if not all musical products, have been preserved. In the circle of musical humanists around Giovanni Bardi, Conte di Vernio, the false conclusion was reached that the Greek tragedies had been musical works not only in their choral sections but in their entirety. This opinion, to be sure, has no basis in ancient traditions; it is due to the experience which these men had with artistic creations of their own time. The *sacre rappresentazioni,* representations from sacred stories—a more spectacular than dramatic popular form of entertainment in the early Renaissance—were already performed in the recitative form so despised by Nietzsche (*fatte in modo di recitazione*). The shepherds' plays were easily sung, Tasso's *Aminta* serving as a sample of a contemporary genre, with verses consisting of eleven or seven syllables. Two examples of this genre, the *Satiro* and the *Disperazione di Fileno,* which are regarded as the first Italian operas, were kept in the *stile recitativo* throughout, very likely accompanied by expressive music—facts later determined by Romain Rolland. Still, something new was arrived at which was neither *rappresentazione sacra* nor pastorale, by consciously, even if mistakenly, taking the path toward Greek tragedy. This step is of an individual, almost violent, nature, leading us, after all the known and unknown preliminary steps, to the first phase in the birth of opera.

The text which Romain Rolland in his earlier work chose as the basis of his description admirably reflects the effect of the find. Since today

we know so well the Italians' great love for their opera, we rarely realize that the experience of opera—the delight in it which Nietzsche mentions—was once new even in Italy, regardless of all precursors, immediate or older. The beginning is shown in all its concreteness at the first performance of the *Favola di Dafne* by Rinuccini, a pupil of Tasso, and composed at first by Corsi and Peri. This work—poetic text and music—may be called the first phase in the birth of opera. The event is described by the composer Marco Gagliano, who ten years later replaced the music of Corsi and Peri with new music to the same text. The description is found in his preface to the libretto, and its value is not limited to the history of music. Events are described here which took place first in the intimate circle of the Count Vernio, in his "Academy," but later before a larger, elegant audience in the presence of the Cardinal Giovanni Medici in Florence.

After having discussed again and again in what manner the ancients had performed their tragedies, how they had introduced the choruses, whether they had used singing and what kind, and similar matters, Ottavio Rinuccini undertook to make a poetic edition of the fable of Daphne, while Jacopo Corsi, of esteemed memory, a lover of every kind of scholarship and of music in particular, composed several arias on a part of the text. Ravished by them, and determined to see how effective they might be on the stage, he, together with Mr. Ottavio, expressed his ideas to Jacopo Peri, an experienced master of counterpoint and singer of the utmost refinement. When the latter had heard the plan and approved a number of the arias already composed, he undertook the composition of others, which pleased Corsi exceedingly.[2]

The piece was performed on the occasion of the carnival of the year 1597. And now follows an account which would seem hardly credible if it described the reaction to a performance of a pastoral play, sung, and with musical accompaniment:

The rapture and wonder roused in the souls of the listeners by this new kind of drama cannot be expressed. Suffice it to say that, no matter how often it was performed, it produced the same admiration and the same joy. Now that the test had been made and Rinuccini realized the ability of the voice to express all kinds of

2. "Dopo l'avere più e più volte discorso ala maniera usata dagli antichi in rappresentare le lor tragedie, come introducevano i cori, se usavano il canto e di che sorte, e cose simili, il sig. Ottavio Rinuccini sidiede a compor la Favola di Dafne, il sig. Jacopo Corsi, d'onorata memoria, amatore d'ogni dottrina e della musica particolarmente . . . compose alcune arie sopr aparte di essa. Dalle quali invaghitosi, risoluto di vedere che effetto facessero su la scena, conferi insieme col. sig. Ottavio, il suo pensiero al sig. Jacopo Peri, peritissimo nel contrappunto e cantore di estrema squisitezza: il quale, udite la loro intenzione e approvato parte dell'aria già, composte si diede a comporre altre che piacquero oltre modo al sig. Corsi. . . ."

feelings, and that this did not result in boredom but, on the contrary, in unbelievable joy, he wrote the *Euridice* and reveled even more in the dialogues.[3]

This refers to monologues and dialogues written for the voice and texts for arias and duets; and with *Euridice* the second phase in the birth of opera began in which it approached Greek tragedy in subject matter as well, thus almost "reaching its true nature," to use Aristotle's phrase.

EXPERIENCING A BEGINNING IN THE HISTORY OF TRAGEDY

In his *Poetics* Aristotle rather sketchily indicates the phases in the birth of Greek tragedy. Let us try to picture, as analogy to what we know about the birth of opera from material still within our reach today, what is really said in that famous chapter of the *Poetics*. The facts are more properly allusions, since Aristotle in this work treats the drama not as historian but from the much more abstract point of view of its mimetic character—"imitation" in every work of fiction. The concrete phases of development which in Athens made up the history of tragedy and comedy he either showed in a separate work or at the beginning of a more detailed history, in a work about the victories at the city Dionysia and at the Lenaea, of the writers of tragedy and comedy. In the *Poetics,* phases of development are indicated casually and without pretension of offering a complete account, particularly for the period of pre-phases corresponding to the "opéra avant l'opéra." For this phase Aristotle emphasized its improvisational character—an element which also functioned in the preliminary phases of opera, although less palpably, owing to its nature.

On the other hand, among the preliminary steps of tragedy we should probably count dithyrambic poetry, which, when thought of in connection with poets like Arion, can hardly be called "autoschediastic" (i.e., improvisational) any more than the dithyrambs of a Pindar or a Bacchylides. It is not to be assumed that Aristotle or any of the literary historians of the Greeks who followed him could have known all that belonged to this period and that in part survived tragedy. However, it was not necessary for the historians to invent data—to construe chapters of literary history. Goethe has expressed what the literature of the past

3. "Il piacere e lo stupore che partori negli animi degl' uditori questo nuovo spettacolo non si può esprimere: basta solo che per molte volte ch'ella s'è recitata, ha generato la stessa ammirazione e lo stesso diletto. Per si fatta prova, venuto in cognizione il sig. Rinuccini quanto fosse atto il canto a esprimere ogni sorta d'affetti, e che non solo non recava tedio, ma diletto incredibilie, compose l'Euridice, allargandosi più ne' ragionamenti."

is, for us, always: "Literature is a fragment of fragments; the smallest part of what has happened and what has been spoken has been written down; and of that which has been written, the smallest part has been preserved." But in classical times a concrete image existed also of that which had not been written. Aristotle and all the ancient sources have transmitted an impression of a period of evocative song and dance preceding tragedy, characterized moreover by the theriomorphic trait of dancers wearing animal masks; *satyroi* is the most common name for such dancers.

Such is "la tragédie avant la tragédie" in Greece which Aristotle indicates in his sketch and which, for us as well as for him, forms the concrete foundation for a history of the birth of tragedy. After a growth through phases with only minor differences (*katâ mikrón*), and after many transformations (*pollás metabolás metabaloûsa*), it—the genre "tragedy"—"stopped when it had found its natural form," the *Poetics* continues. We can ignore the Aristotelianism of the expression and concentrate on the concrete phases. However, even the manner of expression assumes not only a theoretical but also a practical meaning when we reflect that, for us, too—using the history of opera as example again—the opera only really existed when it was embodied in a work which was complete in every respect: in the *Orfeo* of Monteverdi it can be said to have "found its natural form." However, we must admit, on the basis of the fourth chapter of the *Poetics,* that we cannot say for certain whether for Aristotle tragedy attained its nature in the third phase, which is mentioned with the second, or in the first, which the sketch omits. In a continuation of the above, these two phases are named: "Aeschylus was the first to raise the number of *hypokritai* [we shall come back to this word for actors] from one to two; he limited the role of the chorus and made the word the chief actor. Sophocles raised the number to three and introduced painted scenery." Omitted here is the first phase in the birth of tragedy which in all the traditions of antiquity is connected with the name "Thespis"—connected with expressed reference to Aristotle.[4] Either the lost historical work was referred to or a sentence in the fourth chapter of the *Poetics* preceding the mention of the second phase—that of Aeschylus—has dropped out in the handwritten copy.

4. Themistius Orat. 26, p. 316*d;* references for what follows are best found in Sir Arthur Pickard-Cambridge's *Dithyramb, Tragedy and Comedy* (Oxford: Clarendon Press, 1927) and his *The Dramatic Festivals of Athens* (Oxford: Clarendon Press, 1953).

Too many hypotheses have already been set up concerning the literary remains, the poor notes of which they consist. I do not want to add to them, especially since the main traits of a rich reality are fixed without doubt. Like few other nations, the Greeks were receptive to such traits, honoring and admiring them. The way in which the essential truth was kept is Greek—partly anecdotal, but by anecdote we are here referring only to the form. Judging by content, it—an anecdote about Thespis and Solon—could have been the recording of a historical event. As the period in which they lived would have permitted a meeting of the two, no objections can be made against it. There is a perfect parallel between the description of the effect of dramatic-evocative song —the first opera singing—in the *Favola di Dafne* of Rinuccini and this tale of the effect of the art of Thespis. Here, however, we are concerned with the sound of the dramatic-evocative word, or *rhesis,* and of the prologue, in the midst of and in preparation for songs and dances by performers wearing animal masks—the first phase in the birth of tragedy according to the summary which this argument ascribes to Aristotle.

At the beginnings of tragedy we find ourselves in a sphere of literary history which can no more be separated from the rest of Athenian life, particularly the grander life of festival periods, than the sphere of the musical life and the history of music could, at the start of opera, have been separated from the larger life of sixteenth-century Florence. We find in present-day Rome during the Christmas season an analogy to something which was customary during the festivals of Dionysus in Athens, particularly a certain high festival in the sixth century B.C. There are still shepherds from the Abruzzi Mountains who never miss taking part in the great ceremonies of the churches, even the vigils. They take their places in front of the church doors—not all the doors, for their number has grown small. But since ancient times—I know of no history of the custom with more precise facts—they are part of the atmosphere of the holy night and the celebration of Christmas, with their pipes and bagpipes as *pifferari* and *zampognari,* for the evocation of the birth of Christ.

An evocative atmosphere was characteristic also for the festivals of the Greeks—a special one for each festival, and most markedly for the festivals of Dionysus, which also differed among themselves. Surely it was part of the character of the festival in the month of Elaphebolion—the "month of the stag-hunting," roughly corresponding to our month

of March—that Thespis, the son of Themon from the Dionysian village of Icaria, appeared with his invention in just this setting. For posterity he was rightly regarded as Athenian. Icaria was a village at the slope of the Pentelicon, until today called *sto Dionyso* ("at Dionysus'"), a "Demos" of the Athenians but distinguished above all other Attic villages, including Athens, by having the oldest cult of the god in this landscape. It was there that Dionysus was hospitably received when he arrived. For this he gave his host Icarius, its founder-hero, the present of the grape vine and wine. This, too, became a tragic story, which, preserved in epic form by the Alexandrian poet Eratosthenes, probably goes back to the tales of the villages. The Icarians were famous also because the sacrifice to Dionysus of a male goat, the enemy of the vine, was said to have been founded by their hero Icarius; they were the first to dance around the sacrifice and to compete in jumping on a hose they had made from the skin of a goat. Like the shepherds from the Abruzzi Mountains who came to take the place of the shepherds of Bethlehem and to help create the atmosphere for the festival of the birth of Christ, these Dionysian dancers and players came down to Athens from their village in the high mountains to that festival of their god which had as its center the statue of Dionysus from another village: Dionysus Eleuthereus from Eleutherai, originally Boeotian. Why this particular ritual demanded dances by figures wearing animal masks or skins (which we believe were worn by the dancers from Icaria), we can only guess, and this is not essential knowledge for a quick sketch. But the appearance at the festival of a dance chorus from Icaria, with a leader and solo dancer who, in the person of Thespis, appeared as poet and inventor of a new genre, we may consider as a concrete piece of history. It is a picture which every sensible reader of the sparse ancient notes can consider as truth, which is more than we can say for the speculations of scholars, who would like to ascribe it all to the invention of later historians.

Moreover, the time has been fixed for that first performance of a play by Thespis and his chorus which the Greeks themselves consider the birth of tragedy: it was one of the first three years of the Sixty-first Olympiad (536/5–533/2 B.C.). The new element constituting the beginning in the history of tragedy is captured in the anecdote to which we have already referred. It has been preserved in detail in the Solon biography of Plutarch (chap. 29); and in the *Lives of the Philosophers* of Diogenes Laertius (i. 59) it is mentioned and exaggerated beyond the possibilities of history. The wise legislator of the Athenians, al-

though aged at the time, as Plutarch tells us, still liked to take part in all the Dionysian activities suitable for old men—the drinking and the music-making—especially if something new was to be heard or learned. Therefore he was in the audience when once Thespis himself, as was customary with tragic poets of old, "acted." I am using the later, Latin word; the Greek word of the period is *hypokrinesthai.* The *nomen agentis* which goes with it, *hypokrites,* underwent perhaps the greatest change of meaning in the history of the Greek language. It is only through recognizing the original meaning and realizing what it was that Thespis was really doing when, in his own person and yet playing another, he placed a *hypokrites* in the middle of the chorus for the first time that one understands Solon's reaction, for the sake of which this anecdote was told and preserved. The fact that poetic creation is invention, fiction, or, according to the Greek expression, *pseudos,* or "lie," could not have been new for Solon. There is a sentence in one of his elegies which may already have been a proverb before his time: "Greatly lie the singers." But the story goes that after Thespis' production he went up to the poet and *hypokrites* and asked him if he was not ashamed to "lie so grossly" (*telikaûta pseudómenos*). When Thespis answered that it had only been said and done in play, the wise one beat the ground with his stick and prophesied that soon this kind of play would be found in serious matters, too. He was referring to the new art of deception by the evocative word, to which he himself had succumbed in a way different from ordinary performances of rhapsodies and singers. For the first time, Solon had experienced *hypokrinesthai* where before there had been only *apokrinesthai* ("answering").

A quotation from Pindar (frag. 125.69B) long since warned us of the complete change in meaning of the word *hypokrisis: delphinos hypokrisin,* the only proper translation of which is "after the true nature of the dolphin." The latest definitions of *hypokrisis* in the handbooks of rhetoric still retain authenticity (*kat' alétheian*) as an element.[5] Originally, *hypokrinesthai* meant answering—in speech or behavior—according to the real, unadulterated nature, the inner hidden truth, which is not revealed by a simple *apokrisis,* but rather by *hypokrisis,* as if the answer were being given under a higher inspiration. Those who are truly inspired are not only *pro-phetai*—this indicates the direction of the

5. Apsines and Longinus; references and earlier literature in H. Koller, *Museum Helveticum,* XIV (1957), 104 ff., and *Glotta,* XXXVIII (1958), 14 ff., without strict interpretation of the Pindar reference in question.

inspired word—but also *hypo-phetai,* pointing to the divine source. In the *Iliad* the prophetic priests of Zeus in Dodona are called *hypophetai* (16. 235), and the verb *hypokrinesthai* is used when a soothsayer (12. 28), the interpreter of a dream (*Od.* 19. 535/555), or whosoever, speaks a hidden truth, even if he has not been questioned. In judicial language the same word used as an active verb means cross-examining the opponent. The concern is always, in the original sense, with a direct statement of what was hidden and never with interpretation or explanation, which were the province of the *hermeneus.* It was not until truthful, inspired speech on the stage became a special art that the change in meaning took place and that the *hypokrites* became merely the actor and the hypocrite.

What Thespis had not only written but also projected on the stage, thus finding a new genre, was that persuasive, deep truth, a source of profound emotion for all audiences of tragedy since Solon, which nevertheless is "only" play and "lies"—a paradox which the historian must accept and not explain. The wonder at this effect of the first tragedy was once just as real as the wonder at the impact of the first opera, which, moreover, was as little a finished opera as the first play by Thespis was a finished tragedy. One device by which Thespis helped bring out the inner truth of the dramatic-evocative word has been preserved for us and remains characteristic for all of Greek tragedy—the invention of a special mask for the *hypokrites,* setting him apart in that way as well from the chorus of half-animal, half-divine dancers and connecting him with a different world. The tradition of this masking is preserved in an article in an encyclopedia[6]—condensed, and yet two of the three ways mentioned are quite comprehensible, the last as a technical improvement of the first. These concrete details are of the greatest value for the reconstruction of something which really existed, and they are authentic beyond a doubt.

The simplest kind of masking which Thespis used was painting the face with white chalk. Our authors have shown that its manner and meaning existed for a larger circle of popular representations than just the theater.[7] This is how the spirits of the dead were represented. It was an unequivocal connection of the *hypokrites* with the world of ances-

6. Suidas, *s.v.* "Thespis."

7. Compare my "Dramatische Gottesgegenwart in der griechischen Religion," *Eranos Jahrbuch,* XIX (1951), 22–23.

tors and heroes, to whom the stage of the new genre was to belong. A perfection worthy of the apparence of heroes was provided by linen masks, which are mentioned last among the innovations by Thespis. The lexicographer, and probably his philological authorities before him, lacked in botanical knowledge when it came to describing a third kind of masking which came between the first two. We do not fare much better in regard to the flora of antiquity. It is not easy to guess which among the various plants named *andrachne* (endings vary according to region) Thespis used for masking, according to the oldest tradition. We must also consider the wild-strawberry tree, which—or so it appears on the basis of representations on gold rings[8]—played a part in Mycenean cult which it retained later in connection with Hermes, the spiritual leader of the souls for the Greeks.[9]

At this point there are limits to the reconstruction. Were the leaves used as wreath or the berries for painting? We hear of the cart of Thespis on which he carried with him the indispensable requisites for his new kind of plays; this, thanks to Horace, became a tradition, a precedent for troupes of actors in later times.[10] In connection with an object which was originally used in the ritual and later in the play, we even have the record of one detail immediately preceding the phase of the invention of tragedy by Thespis: this was a sacrificial table in the theater (called already in Homer, *eleós*), used for the cutting-up of the meat, which points to the ever preceding sacrifice. Earlier, he who answered from the chorus (*apekrinato*) would leap on to this table.[11] A dialogue had existed even before Thespis, probably between the person making the sacrifice and the dancers around him. But this was not yet the *hypokrisis* with which tragedy had its beginning; the evocative, true word sounded from the mouth of a being with a white face, as if from another world. This is how the new genre was born.

8. See Martin Nilsson, *The Minoan-Mycenaean Religion* (Lund: C. W. K. Gleerup, 1950), Fig. 158 and perhaps Fig. 124, about wild-strawberry trees in Greece. Compare Frazer in his *Pausanias* v. 149.

9. Paus. 9. 22. 2

10. This is how we are to understand the famous place in the *Ars poetica: plaustris vexisse poemata Thespis.*

11. Pollux 4. 123 and Etymologicum magnum *s.v. "thymele."*

THE ORPHEUS THEME IN RINUCCINI AND POLIZIANO

After the first performance of the *Favola di Dafne* by Rinuccini, Corsi, and Peri in 1597, the inventors of opera consciously approached the task of perfecting the new genre. We must assume a similar intention in the Greek tragedians who undertook the perfecting of the invention of Thespis: the consciousness that a new art form—the art of the spoken dramatic word for the Greeks, of the sung dramatic word for the Italians—had been found, and its highest possibilities not yet realized. Only the poets and composers of the end of the sixteenth century thought of the ultimate possibility as in a sense already realized in their false picture of Greek tragedy. The proof for this knowledge of the new situation and the artistic aim is found in the preface which Rinuccini wrote for a second dramatic-musical composition (the second phase in the birth of opera) and published with the libretto. Here, too, the name of the poet comes first; this is the phase of *Euridice* by Rinuccini, Peri, and Caccini. Its first performance took place in the year 1600 in Florence in the Pitti Palace, on the occasion of the marriage of Maria Medici with the king of France.

Consciously, here (I quote from the preface), the *Favola di Dafne* is referred to as a phase in the invention of opera: "It was the opinion of many," the poet of the new queen relates, "that the ancient Greeks and Romans sang their whole tragedies on the stage; but this noble manner of performing was not only not revived, but, as far as I know, never even tried by anyone; and this, I believe, is a fault of our modern music which lags so far behind that of antiquity. But this idea of mine was completely refuted by Jacopo Peri when, after hearing of my and Jacopo Corsi's intention, he so charmingly composed the fable of Daphne."[12] But, then, we are forced to ask, what in the new piece went farther in the direction of Greek tragedy? The poet goes on to apologize in his preface that a further step toward tragedy was prevented by the joyous occasion—the royal wedding—and that, in the fable he had chosen, he was forced to alter the tragic ending which would have brought the new work quite close to Greek tragedy.

12. "E stata openione di molti, Cristianissima Regina, che gli antichi Greci e Romani cantassero su le scene le tragedie intere, ma si nobil maniera di recitare non che rinovata, ma nè pur che io sappia fin qui era stata tentata da alcuno, e ciò credev' io per defetto della musica moderna di gran lungo all'antica inferiore: ma pensiero si fatto mi tolse interamente dall-animo messer Jacopo Peri, quando udito l'intenzione del Sig. Jacopo Corsi e mia, misse contanta grazia sotto le note la favola di Dafne."

The prologue is proof that, with the choice of subject, the Orpheus myth, the decisive step had been taken even though the author had been forced to deviate from it. In the *Favola di Dafne* the prologue was spoken first by "musica," later by "Ovidio." Both versions express the opinion of their authors as to where their work belonged: in music and in the tradition of Ovidian poetry. In *Euridice,* "tragedia" appears to give the prologue and to reassure the public: it will not come to a real tragedy, as the Florentines would expect from the title of the melodrama. Rinuccini has his Orpheus lead Euridice from the underworld and live with her in marital happiness, as is proper in a wedding piece of good omen. The fact that it is *tragedia* who prepares for this end meanwhile is justified by a connection which had already been established between the Orpheus theme and tragedy. The myth was familiar through Vergil and Ovid. The use of the material as tragedy in Italy belongs to the period of the "opéra avant l'opéra" and was the work of Agnolo Poliziano—the *Favola di Orfeo* expressly called "tragedia" in the Codex Reggianus to which Rinuccini could refer as a famous earlier version of the theme.

Just as another *Dafne* in 1486 had been accompanied by the music of one Gian Pietro della Viola, so a musician can be named in connection with the first performance of Poliziano's *Favola di Orfeo,* according to Romain Rolland; but the mere name "Germi" does not tell us much, and the piece has not become famous through its musical accompaniment. It represents a new start in the dramatic writing of the Italians—the first act constitutes the beginning of the pastoral play—and even though it is not improvised on the stage, as a piece written for an occasion, in a sense it belongs with the improvisations. The occasion was the celebration of a double engagement in Mantua in 1480: that of Clara Gonzaga to Gilbert de Montpensier and of Francesco Gonzaga to Isabella d'Este. The poet himself in his preface somewhat apologetically emphasizes the improvisational nature of the piece and immediately sounds the motif which connects this little drama with Greek tragedy—the mutilation of Orpheus:

> I wish that the *fabula* [this, in Latin, is also the word for tragedy] about Orpheus which I wrote at the request of His Eminence the Cardinal of Mantua, in two days, with continuous disturbances, in the vulgar style so that the audience would understand it better—I wish it could be torn up at once, just as Orpheus himself was

torn. For I know well that this my daughter is so constituted that she would cause her father shame rather than honor, sorrow rather than joy.[13]

Poliziano originally wrote no more than four hundred short lines creating a kind of *sacra rappresentazione* with heathen content, inserted Latin verses instead of liturgical hymns into the Italian text, and did not dream of reawakening Greek tragedy. Insofar as the birth of opera can be called the rebirth of tragedy, he involuntarily took the place in it which we might assign to one of the many autoschediasms before Thespis.

Poliziano's work is certainly not the dramatic-evocative word of true tragedy and probably was not yet combined with dramatic-evocative music. But he surprises us, at the celebration of a double engagement, with the boldness of the unrelieved tragic ending. At the end of the fourth act, Euridice is torn from Orpheus by the powers of the underworld. This is followed by a fifth act, called "Baccanale"; and here it becomes obvious that in Poliziano there dwelt not only epic sources like Vergil and Ovid but also the *Bacchae* of Euripides, a tragedy which he could obtain in Florence in two fourteenth-century manuscripts. Up to this point he had dramatized the myth in a more medieval way; here he drew his inspiration from Greek tragedy. His reading must have moved him deeply—he mastered the language so well that he could write faultless Greek verse—and Greek tragedy awoke in him, even when he had no intention of awakening it.

The scene of the bacchanale is in Thrace, where, according to all ancient tradition, the mutilation of Orpheus took place. The singer makes his entrance with three verses in *ottave rime* which could well have been included in the two volumes of collected "stanze" by Poliziano. The last verse is dedicated to the theme of misogyny, anticipating the "la donna è mobile" of Verdi, like so much else in this true "work of promise" in the Ruskinian sense: with the pastoral play it combines lyric tragedy. Abruptly, one of the bacchae appears and calls others:

> See there is he who scorns our love.
> Oh, Oh, sisters, Oh, Oh, let us give him death.
> Seize thy thyrsus, do thou break down that branch.

13. "Desideravo, che la Fabula di Orfeo la quale a requisizione del nostro Reverendissimo Cardinale Mantovano, in tempo di due giorni, intra continui tumulti, in stilo vulgare perchè dagli spettatori meglio fosse intesa, avevo composta, fusse di subito, non altrimenti che esso Orfeo, lacerata, cognoscendo questa mia figliucla essere di qualità da fare più tosto al suo padre vergogna che onore, e più tosto atta a dargli malinconia che allegrezza."

Take thou a stone or fire and hurl it hard: do thou haste
and take yonder cudgel.
Oh, Oh, let us make the wretch pay the penalty!
Oh, Oh, let us pluck the heart out of his bosom.
Let the villain die, let him die, die.[14]

In this cry for the punishment of the transgressor who repudiates the love of women all the elements are present which are usually seen in antique representations of the death of Orpheus at the hands of wild Thracean maenads—yes, even more: one hurls a thyrsos at him, another breaks off a branch for the same purpose, still others seize stones and fire to throw at him. A tree is to serve as lance against him, the singer's heart is to be torn out of his breast; this is a motif from the orphic myth about the child Bacchus who was torn to pieces by the Titans but whose heart was kept in a covered basket.

It must have been a tumultuous scene on the stage in Mantua; and now the Bacchante returns to the foreground with the head of Orpheus, triumphant:

Oh, Oh, Oh, Oh, the wretch is dead!
Evoè, Bacchus, Bacchus, I thank thee.
Throughout all the wood have we rent him,
And every twig is soaked with his blood.
We have torn him limb from limb
In many pieces with cruel torture.
Go now and scorn the wedding torch.
Evoè, Bacchus! take thou this victim.[15]

14. English translations introduced into the text of Italian verse which is given in nn. 14, 15, and 16 are by L. E. Lord, "The Orpheus of Angelo Politain," *The Orpheus and Aminta* (London: Oxford University Press, 1931).

"Ecco quel che l'amor nostro dispreza!
O o sorelle! o o diamogli morte.
Tu scaglia il tirso; e tu quel ramo speza;
Tu piglia un sasso o fuoco, e getta forte;
Tu corri, e quella pianta là scaveza.
O o! facciam che pena il tristo porte.
O o! caviamogli el cor del petto fôra.
Mora lo scellerato, mora, mora!"

15. "O o! o o! morto è lo scellerato.
Evoè, Bacco, Bacco! io ti ringrazio.
Per tutto 'l bosco l'abbiamo stracciato
Tal ch'ogni sterpo è del sangue sazio:
L'abbiamo a membro a membro lacerato
In molti pezi con crudele strazio.
Or vada e biasmi la teda legittima!
Evoè Bacco! accetta questa vittima."

In this verse we have a vivid description of something called *sparagmós* in Greek and which is shown nowhere else in such detail: the sacrifice is torn apart limb by limb (Orpheus is expressly called "sacrifice," *vittima,* to Bacchus); his limbs are dragged through the woods, and the hard branches are soaked with blood. The entrance with the severed head, however, is obviously taken from the *Bacchae* of Euripides. There Agave appears with the head of her mutilated son Pentheus, as if it were the head of a slain lion—a scene which Goethe found so unbearable that in his translation he toned it down, at least in one descriptive detail: he had the mother carry the head on the point of a thyrsos over her shoulder instead of in her bare hands, just as Poliziano's maenad carries the head of Orpheus after the ancient model.

A bacchic dance is performed around the head—there is no other way we can imagine it—with a song for drunkards having this refrain:

> Let every one follow thee, Bacchus, Bacchus, Bacchus, evoè, evoè.[16]

To our way of thinking, a song by drunkards is a strange note on which to end a tragedy; or perhaps not so strange when we remember that the finale of Greek tragedies consisted of satyr-plays. What Poliziano succeeded in doing with such ease in the flowering of the Renaissance in 1480 was this: he returned a tragic Greek subject—indeed, as is becoming clear, the primary material of Greek tragedy—to the natural soil of a southern wine-growing culture; and, by placing the power of the wine-god in the foreground, enabled him to become the high point of the festivities, even at the celebration of a double engagement. The fact that the mutilation of Orpheus was the theme of a tragedy by Aeschylus could have been familiar to him through the Codex Laurentianus Mediceus of Pseudo-Eratosthenes which belongs to the same century. However, it was no mere humanisitc learning which moved him but the very theme itself which in the Greek tragedians had already been connected with the names of Pentheus and Orpheus. A *Pentheus* is cited among the tragedies of Thespis. Aeschylus, too, had written a *Pentheus* as well as his tragedy about Orpheus, the *Bassarai;* and it is mere chance that the remolding of the Pentheus material in the *Bacchae* of Euripides has been preserved as the last work of the youngest tragedian.

16. "Ognun segua, Bacco te.
Bacco, Bacco, eù, oè."

If in the case of Pentheus and Orpheus we talk about a common tragic material as two variations on the same theme, we do so in view of the deeply moving kernel of this theme: the *sparagmós*. For whatever precedes this peculiar action makes sense only as cause for it. But even in the causes there is a certain amount of agreement. In the *Bacchae* of Euripides, Pentheus was torn to pieces by his own mother; thus he, the enemy of Dionysus, was punished; but Agave, too, was punished because she would not believe in the divinity of her sister Semele's son. As enemy of the god, Pentheus probably had to suffer in Thespis and Aeschylus. For the bacchae in the *Bassarai* (this was the name for the maenads in Thrace) of Aeschylus, Orpheus, too, must have belonged to the enemies of Dionysus, since he apparently worshiped Apollo exclusively. Still his fate can be called "Dionysian," because Dionysus among the gods suffered the same fate as Orpheus and Pentheus; he also, as has been mentioned before, was torn to pieces, according to a myth which has been preserved as Orphic tradition.

The name "Pentheus" means "man of suffering." An intensification of it is "Megapenthes" ("man of great suffering"). A mythological king of Tiryns and Argos with this name was also known as a persecutor of Bacchus.[17] But how was it possible to give such a name to a living or fictitious person? The fact that the name was not given without reason is proved by a tale in the *Odyssey* (4. 11) in which Menelaus called a son born to him late in life (not by Helen but by a slave) "Megapenthes," meaning "to his great sorrow." When the name occurs in a tale about the sufferings of a god, such as the persecution of Dionysus, we must look there for the reason. The name "Pentheus" can be found on a list of men in Knossos containing other, bacchic names like Iacchos and Phales.[18] The name "man of suffering" could also be given to a follower of Dionysus, in memory of the fact that the god at first suffered, then withstood, holy and glorious. On the stage, Pentheus and Orpheus were substitutes for the god in whose honor the tragedies were written and performed. One tradition tells of a third enemy of Bacchus, his persecutor Lycurgus, whose history was dramatized by Aeschylus, that he and Dionysus were considered the same divine being because of the similarity with which both were venerated.[19]

17. Cf. my *Heroes of the Greeks* (London: Thames & Hudson, 1959), Index.

18. *Diogenes*, No. 20 (1957), p. 14.

19. Strabo 10. 3. 16.

The myth about the mutilation of heroes, of a Pentheus or an Orpheus, was originally the story of the suffering of the god who for all antiquity was considered the god of wine. His presence in the wine presumes his presence in the grape, which has to be torn up, broken, trampled on, to become wine. We are told of songs which were called *melos epilenion* ("song of the grape").[20] In Latin they would be *carmina calcatoria,* as the *lenos* was the vessel in which the grapes were crushed. And one tradition tells us[21] that the song, like the *lenos,* contained the *sparagmós* of Dionysus. It would be straining the literal wording of this valuable piece of information about a peasant song to try to read more into it than the following: "As the grape now suffers, thus once suffered Bacchus. . . ." Titans appear—this, too, is recorded[22]—in the work of the poet and theologian Onomacritos in the sixth century B.C., as executors of the *sparagmós* of the god; and since then they belong to the orphic tradition in a literary reshaping of the myth about the sufferings of the child Bacchus. The songs about the *lenos* could have remained untouched by this reshaping.

Besides the god and the grape, another being suffered the same fate: the *tragos,* or goat, which was sacrificed to Dionysus with the reason that it was an enemy of the vine and thus of Bacchus. At the same time the god himself was called *eriphos* ("kid"); a name for which no other reason can be imagined but the ritual in which not a grown goat but a kid was sacrificed to Dionysus and at the same time took his place. Here we find the same paradox—we may call it "tragic" in the sense of the modern meaning of the word which is derived from the tragedy and *tragos* and thus designate, at the same time, the first bearer of this paradox—as in the case of Pentheus and Orpheus on the stage: the god is honored through a representation of his own suffering by the sacrifice of a creature which is both an enemy and an embodiment of him. The goat gave his blood to the grape vine—as punishment: this is how one side of the tragic unity, the natural enmity between goat and vine, was emphasized. No less naturally, however, the other side appeared: the similarity of the two and of wine; the same divine exuberance with

20. Athenaeus 199.

21. Schol. in Clem. Protr. 1. 2.

22. Paus. 8. 37. 5; references to what follows in my article quoted above, "Dramatische Gottesgegenwart . . . etc.," expanded in Italian as "Un sacrificio dionisiaco," *Dioniso,* XIV (1951), 3–4.

which the god Dionysus appeared to his followers. His presence in goat and vine, grape and wine, is not to be thought of in a material and exclusive form, as if goat, plant, grape, and wine had been dipped and formed out of Dionysus and thus made out of the same substance as he; one has rather to conceive of the all-inclusive presence of a divine being who stands above separate phenomena: *"There, too,* is the god and suffers and will rise again!" And this is not in any pantheistic sense but refers to a very specific deity whose presence does not include *everything* but only that which is "Dionysian": goat, vine, etc.

For the rites with which he was worshiped not only were goats chosen as sacrifice but also young deer. And these rites were carried out, not in one or two simple ways—the butchering of a large buck or the dismembering of young animals—but the mutilation could also follow the butchering and be accompanied by dramatic acts corresponding to the myth of the suffering of the god. On the Island of Tenedos, where the Dionysus sacrifice was that of a young bull, the ceremony began by giving the cow which had born the sacrificial animal nursing care like that of a young mother and by putting buskins on the calf such as Dionysus[23] had worn and after him the actors on the stage. This is not the only article of clothing worn by the *hypokrites* which was originally worn by the god and inherited by him who suffered his sufferings.[24]

The word *tragodia* ("tragedy") originally meant a song for which the prize was a goat or a presentation whose actors wore goatskins. The time for the festival of the "great Dionysia" (*megala Dionysia*), to which Thespis came from Icaria with his chorus versed in dances and songs about the sacrificial buck, was the Elaphebolion, which roughly corresponds to our month of March. In this month the vines are still without leaves and tendrils, like bald stumps cut down almost to the ground, very much in need of resurrection which could be expected from the blood of the sacrificed enemy. The name "month of the stag-hunting" strengthens the hypothesis that not only goats but other kinds of bucks as well had to give up their lives for this purpose. In a curious way the line from Poliziano seems to fit in here:

May every dry twig drink its fill of blood.

23. Walter Friedrich Otto, *Dionysos: Mythos und Kultus* (Frankfurt am Main: V. Klostermann, 1933), p. 178.

24. Margarete Bieber, *The History of the Greek and Roman Theater* (Princeton, N.J.: Princeton University Press, 1939), 33.

The "pathos" in the realm of Bacchus—the suffering of the god in the grape, in the sacrifice, in all of animal and vegetable nature—is the great mystery of the Dionysian religion: suffering from which springs the happiness of a civilization founded on the wine culture. Pity, *pietà* in the prologue of Rinuccini's *Euridice* (the Greek word is *éleos;* the accent alone seems to distinguish it from the *eleós* meaning sacrificial table[25]), is the result of tragedy, just as its cause is the myth of the suffering god represented by the buck, *eriphos* and *Dionysus.* The "little buck Dionysus" indicates the mystery: in all butchered and torn things he suffers who is being celebrated. Dionysus suffers in Pentheus, in Orpheus, in all heroes whose tortures fill the tragic poetry of the Greeks. He was called as "son of the steer" from the underworld, also as "esteemed steer," and at the same time as "heros Dionysos."[26] According to Aristotle, pity and fear had a cleansing effect on the audience. Cleansing, indeed; but, we may ask, with the Greeks of that day, for what if not for the joy of living?

This, too, is the meaning of the *Orfeo* by Agnolo Poliziano, that lyrical tragedy of the fifteenth century which is the prelude to Italian opera. But what Poliziano dared in 1480 Rinuccini no longer dared in 1600. His *Euridice* with its happy ending heralds the *Orfeo ed Euridice* by Gluck and Calzabigi and the freedom of opera which made it relinquish the approach to Greek tragedy as soon as it had attained its true nature. This happened soon afterward in the third phase of the birth of opera with a *Favola di Orfeo.* In this case the name of the composer can no longer take second place: the work by Claudio Monteverdi and the poet Alessandro Strigio the Younger was performed at the carnival of the year 1607 in the Accademia degli Invaghiti ("Academy of the Ravished") in Mantua. It consisted of five acts, like Poliziano's *Orfeo* in its final form in the Codex Reggianus. Beginning with the fourth act, Strigio's libretto follows that model. The later editions and performances usually close with the fourth act. The text of the fifth act has always been known, but the music for it has only recently been discovered and published.[27] Quotations from the text

25. Compare Hesiod op. 265, *eleón,* "pitoyablement" (Mazon ed.).

26. Plut. Is. et Os. 35; Quaest. Gr. 36; the interpretation of the references as proof for Dionysus as god of the underworld and thus as god of tragedy in my *Heroes of the Greeks,* pp. 23 ff.

27. By G. Francesco Malipiero, *Per canto e pianoforte* (Milano, 1950).

alone would not tell us much. Here it seems for a moment as if the rebirth of tragedy were actually taking place in opera. Backstage, Orpheus is being torn to pieces; on stage the maenads are singing triumphantly, not like drunk Thracian women but like true Bacchae moved by their god, as Euripides depicted the devout Dionysian chorus in his tragedy. They are glorifying Bacchus, conqueror of the East, victorious lion. Two years later Monteverdi had already suppressed this ending, denying himself the Dionysian finale. In the edition of 1609 he has Apollo, the father of the singer, appear at the end instead of the Bacchae. The god takes his son with him, and the opera ends with the ascension of Orpheus.

The singer whose myth announced the almighty power of song brought tragedy to the stage as the sacrifice of all living things to the tragic laws of the world. His liberation from these laws, the apotheosis of the almighty singer, opened up the free world of opera in which everything has become possible—possible with such ease that it even allows playing with the tragic. And this is just what the Baroque period chose to do. Orpheus could again be torn to pieces. This happened in the first opera given in France, the *Orfeo* of Luigi Rossi in 1647. I shall quote the conclusion of the fantastic plot, using the synopsis by Romain Rolland, who, in his *Musicians of Former Days,* devoted a special essay to the event of this first opera performance in Paris:

> ... Bacchus and the Bacchantes tear the Thracian singer to pieces. In the Apotheosis the constellation of Lyra is seen rising in the sky, and choirs sing the glory of love and conjugal fidelity. Lastly, Jupiter, in a recitative air full of stately vocal flourishes, points the moral of the story in a madrigal addressed to the queen.[28]

28. "The first opera played in Paris" (*Musicians of Former Days,* trans. Mary Blaiklock [New York: Henry Holt & Co., 1915], p. 70).

K. A. Nilakanta Sastri

ANCIENT INDIAN CONTACTS WITH WESTERN LANDS

In the last century and in the first decades of the present century the historians of India laid stress on the isolation of the subcontinent by the mountains and seas surrounding her on all sides and cutting her off as a separate universe. The progress of modern research has shown how mistaken this view was. We now see the true facts much more clearly than ever. The mountain barriers, though formidable at many points, are broken by gaps which have always allowed a considerable intercourse across the frontiers on the northwest as well as the northeast and at some points due north as well. By her position in the center of the littoral of the Indian Ocean, India enjoyed ample facilities for communication by sea with the countries lying to her west and east, and we now know that she and her neighbors availed themselves of these facilities from time immemorial. The Indian Ocean was navigated freely from very early, even prehistoric, times, and there was a series of lively maritime exchanges—migratory, commercial, and cultural—among the peoples of Africa, India, and Indonesia, or more generally Southeast Asia. Western Asia and the lands adjoining the

Levant also took, from the beginning, a prominent part in this commerce of goods and ideas between India and the world. It is the aim of this paper to trace briefly the ancient contacts between India and the Western countries to the time when the rise and spread of Islam and the Islamic impact on India ushered in a new epoch.

Archeology has shown that the dawn of civilization occurred first in Mesopotamia around 4000 B.C. and that Egypt and the Indus Valley developed along similar lines about a thousand years thereafter. These civilizations and that of Minos had so many resemblances that Sir John Marshall was led to postulate a common parent for all the four cultures —a common Afrasian chaleolithic culture of which they were articulations adapted to local conditions.

It is worth recalling in this context that students of art history (A. K. Coomaraswami, Parmentier, etc.) have been struck by the employment of common architectural forms and motifs (e.g., entwined dragons and serpents in stones, vases, and on knife handles; or the deer with four bodies and one head) over the vast area stretching from the Mediterranean to China and Indonesia and have felt the need for a postulate similar to that which Marshall has suggested. Both by the tremendous area of its provenance and by the continuity of its influence on later Indian civilization, the civilization of the Indus Valley takes rank as perhaps the most important among these ancient civilizations. "The Indus civilization," according to Gordon Childe, "represents a very perfect adjustment of human life to a specific environment that can only have resulted from years of patient effort. And it has endured; it is already specifically Indian and forms the basis of modern Indian culture."[1] The contacts between the Indus civilization and the western Asian lands appear to have been constant and culturally important. Commerce linked the cities of Sumer with those on the Nile and on the Indus, and the specialized products of urban industries were traded in their bazaars. Several Mesopotamian cities have yielded stray seals, beads, and even pots which were not Sumerian but common in the contemporary cities of Sindh and the Punjab, more than a thousand miles away. We can visualize regular caravans crossing the mountains and deserts of Iran, fleets of boats following the coast of the Arabian Sea, and colonies of Indus merchants settled at Ur, Kish, and Babylon. To quote Professor Childe again:

1. *New Light on the Most Ancient East* (1934), p. 220.

> Now that sort of commerce in the Orient is not, and never can have been, a mere transportation of bales of merchandise from place to place. At the termini and at stations on the way caravans and merchant dhows must make prolonged halts. Representatives, probably colonists from the exporting country, must receive the goods at their destination and arrange a return load, entertaining the travellers in the meantime. Just as there are permanent colonies of British merchants in Oporto, Stamboul, and Shanghai, so we may imagine colonies of Indian merchants settled at Ur and Kish. Trade under such conditions is very really a means of intercourse, a channel by which ideas can be diffused on an international scale.[2]

We now lack the means, however, of determining the nature and range of the ideas of the time, and we must await the satisfactory interpretation of the inscribed Indus seals for light on this matter. We know, however, that trade between the mouth of the Indus and western Asia by way of the Persian Gulf and perhaps the Red Sea also continued down to Buddhist times. Hiram, king of Tyre, imported "ivory, apes and peacocks" for decorating the palaces and the temple of King Solomon (*ca.* 975 B.C.).[3] Apes, Indian elephants, and Bactrian camels are represented on the obelisk of Shalmaneser III (860 B.C.), and the Bāveru Jātaka mentions Indian merchants. "It has been claimed," says H. G. Rawlinson,[4] "that the word *Sindhu,* found in the library of Assurbanipal (668–626 B.C.) is used in the sense of Indian cotton, and the word is said to be much older, belonging in reality to the Akkadian tongue, where it is expressed by ideographs meaning 'vegetable cloth.'" Assurbanipal is known to have been a great cultivator and to have sent for Indian plants, including the "wool-bearing trees" of India, as Herodotus called them. After the fall of Assynia in 606 B.C., Bablyon rose to be a crowded market city, the meeting ground of all races—Iranians, Jews, Phoenicians, Indians, and others who came to sell their wares. The Greek words for "elephant" and "tin" (*Kassiteros*) are clearly derived from India and of Sanskrit origin (*ibha-danta* and *Kastira*).

2. *Man Makes Himself* ("Watts, Thinkers' Library," No. 47 [1941]), pp. 149–50. Stuart Piggott seems grossly to underestimate the role of Indus civilization by extending to the whole of its history the traits that marked its decadence about 1500 B.C. (*Some Ancient Cities of India* [O.U.P., 1945], pp. 16–17). Toynbee (*Study of History,* I, 107–8) and Langdon (*JRAS,* 1941, p. 593) have stressed the extraordinary affinity between the Sumerian and Indus Valley civilizations and postulated a close connection or even identity between the two.

3. I Kings, chaps. 10–22.

4. *Intercourse between India and the Western World* (Cambridge: Cambridge University Press, 1926), p. 2.

The second stage of Indian civilization was the period of the *Rig-Veda* in the second millennium B.C. The agreements between the languages and mythology, the religions, traditions, and social institutions of Indians and Iranians, on the one hand, and those of the Greeks, Romans, Celts, Germans, and Slavs, on the other, are well known and need no elaboration here. But the evidence from western Asia needs special notice. Hittite kings bore Aryan names; and inscriptions from Boghaz Keui and elsewhere in Asia Minor, dating from about the beginning of the fourteenth century B.C., reveal the names "Mitra," "Varuna," "Indra," and "Nāsatyas," and some numerals and other words, not in their later Iranian forms, but in the earlier Indian. These have been held to be the records of the Aryan people not yet differentiated into Iranians and Indians;[5] if this view is correct, and it is widely accepted, these records are of little value to a study of Indian contacts with Western lands. But Jacobi held another view, and Sten Konow[6] strongly supports it. He believes that the Indra of the Mitani was the well-known Indian god, not a pre-Indian Aryan deity. We must accordingly assume that Indian civilization had, in the middle of the second millennium B.C., extended to Mesopotamia and beyond, and date its beginning much earlier. The interval was perhaps long, for the Asvins are invoked in the Mitani treaty evidently to protect the marriage of Subbiluliuma's daughter with Mattiuaza, king of Mitani. In other words, the bulk of the Rig-Veda, including the marriage hymn in the tenth *mandala,* must be assumed to have been in existence before the date of the treaty.

Even in a study of these very early contacts, we should not confine our attention to the northwest and north of India but take the south also into view. J. Kennedy has rightly pointed out that "rice, peacocks, sandalwood, every unknown article which we find imported by sea into Babylon before the fifth century B.C., brought with it a Dravidian, not a Sanskrit designation."[7] In the seventh century B.C. traders from the West "introduced into South China a system of inscribed coinage based on a Babylonian standard," and a sea trade between Babylon and China necessarily includes South India. A beam of Indian cedar found in the palace of Nebuchadnezzar (604–562 B.C.) and the teak logs found in the

5. *Cambridge Ancient History,* I, 13.

6. *The Aryan Gods of the Mitani People* (Kristina), p. 39.

7. "The Early Commerce of Babylon with India," *JRAS,* 1898.

temple of the moon-god at Ur at levels belonging to about the same age or a little later furnish further evidence of the role of South India in this intercourse. Facts like these should receive more attention from the present generation of Indian archeologists, who, along with Sir R. E. M. Wheeler, seem to be inclined to place a bigger burden on the evidence of excavations at Brahmagiri, Arikamedu, and other places than it can bear and to date the beginnings of the historical Davidian civilization in the Mauryan epoch or only a little earlier.

The prehistoric overland contacts between India and the Western lands could not have ceased altogether at any time, and the rise of the Achaemenid Empire of Persia in the sixth century B.C. linked the Greeks of the West closer to India by way of well-laid roads that came into being throughout the empire. The connections between the Ionian Greeks of Asia Minor and the eastern countries became so varied and numerous that there must have been many occasions for the exchange of ideas between the Greeks and Indians then living in Persia. "At no time were means of communication by land more open or the conditions more favourable for the interchange of ideas between India and the West." Indian troops took part in the invasion of Greece in 480 B.C., while Greek officials and mercenaries served in various parts of the empire, including India. As Filliozat points out:

> During the Achaemenid times the valley of the Indus, which had been conquered by Darius, remained for two centuries linked to the Iranian empire, having the same status as Egypt, Syria, Asia Minor, and Mesopotamia, and it came to have extensive intercourse with these countries. But the centre of the Indian civilization at the time was in the Ganges valley, where flourished, surpassing all, the eastern kingdom of Magadha. After having traversed the Persian empire Alexander rapidly overran its ancient Indian satrapies. He could not push beyond that. The seizure of these territories by him, far from constituting a conquest, had rather the effect of making it possible for Indian civilization to reclaim these regions within a short period, a development which the Achaemenids had been able to avoid.[8]

The rise of the Achaemenid Empire coincided with the close of a period of the most intense religious and philosophical speculation in India, the age of the *Upanishads,* the next great epoch in the history of Indian civilization after that of the *Rig-Veda.* This period may be taken to have lasted from 900 to 600 B.C. Its main characteristics have thus been summed up by Radhakrishnan:

8. "Les Échanges de l'Inde et de l'Empire romain aux premiers siècles de l'ère chrétienne," *Revue historique,* janvier–mars, 1949; translated into English by Sourindranath Roy M.A., *Journal of Indian History,* Vol. XVIII.

> For the first time in the history of thought, the Upanishads indicate a religious view which has for its integral elements: the supremacy of the Absolute spirit; the reality of mystic consciousness; the distinction between intellect soberly contemplating the intelligible and intellect rapt into enthusiasm and borne above itself; higher and lower knowledge; the *via negativa* as the way of approach to the mystic consciousness; the nonultimateness of the pluralistic universe with its independent existents, some with life, some with consciousness; insistence on ascetic discipline; rebirth determined by the law of Karma, until the destiny of man is realized which is release or deliverance. . . . This religious outlook seems to have affected the thought of the West from very early times.[9]

The age of the *Upanishads* in India was also important in the history of Greek thought. It witnessed a revolt against the traditional polytheism reflected in Homer and the rise of philosophic speculation. The coincidences between Indian and Greek philosophy are so numerous that some historical connection between them has to be postulated, and the alternative explanation that similar conclusions were reached by Greeks and Indians independently of each other does not strike one as adequate. Thales (*ca.* 640-550 B.C.), the father of the Grecian philosophy, imagined everything to have sprung from water; this reminds us of the Vedic myth that the waters were first created and that the whole universe evolved out of them. A little later the Eleatic school—Xenophones, Parmenides, and Zeno—taught ideas very similar to those of the *Upanishads,* that is, that God and the universe are one, eternal, and unchangeable, that reality is due to this universal being alone, neither created nor to be destroyed, and omnipresent, that whatever is multiple and mutable is not real, and that thinking and being are identical. Some are inclined to see a remarkable agreement even in the style of presentation. Richard Garbe, for instance, notes that in both the *Upanishads* and Parmenides "we find a lofty, forceful and graphic mode of expression and the employment of verse to this end."[10] The same scholar, while deprecating extreme and dogmatic views on the subject, is definitely of the opinion that in this respect Greece was the debtor to India. He says: "The *historical possibility* of the Grecian world of thought being influenced through the medium of Persia must unquestionably be granted, and with it the possibility of the above-mentioned ideas being transferred from India to Greece."[11] Likewise, Hugh E. M. Stutfield

9. *Eastern Religions and Western Thought* (Oxford, 1939), p. 133.

10. *The Philosophy of Ancient India* (Chicago: Open Court Publishing Co., 1897), pp. 32–33.

11. *Ibid.*, p. 38.

has said: "Especially does there seem to be a growing probability that from the historical standpoint at any rate, India was the birthplace of our fundamental imaginings, the cradle of contemplative religion and the nobler philosophy."[12] There are also striking agreements between the Sānkhya teaching and the views of Heraclitus, Empedocles, and Anaxagoras which need not be set forth here in all their details. To Heraclitus, moreover, logos was the eternal law of the course of the world. In *Rig-Veda* (X. 125) *vāk* (a feminine noun meaning voice, speech, word) already appears as an active power and develops in the *Brāhmanas* to something more similar to the Logos in the beginning of the Gospel of John—Vāk being regarded as the consort of Prajāpati, the creator, in union with whom and by whom he accomplishes his creation. The doctrine of Logos was taken over from Heraclitus by the Stoics and by Philo, and later became the basis of Neo-Platonism.[13]

When we turn to the mystery cults and the teachings of Pythagoras and Plato, we find the clearest evidence of the debt to India and almost a decisive break from the general trend of Greek rationalism. Orpheus, reputedly a Thracian, became the prophet of a religious sect with a code of rules of life and a system of purificatory and expiatory rites. Dionysus is the god of the cult, and faith in immortality of the soul is a cardinal feature of the Orphic religion. There is no unbridgeable gulf between God and the soul, and the release of the higher divine elements in man from the lower non-divine is the objective of the Orphic discipline and religion. There is a long way to go before this freedom is attained, and the soul transmigrates from body to body in a perpetual journey through the great circle of necessity. The wheel of birth goes on until the soul escapes it by attaining release. Orphism transcends the limits of blood groups and holds that all men are brothers. It takes little account of the civic virtues characteristic of Greek morality. All life is one, and by his lyre Orpheus spread harmony in the animal world and softened the hearts of men. Orphic religion was very different from the anthropomorphic worship of Homeric Greece. Its adherents were organized in communities based on voluntary admission and initiation. In the cosmogony of Orphism the world egg plays a big part as in the Indian cosmogony: "Those who are familiar with the vedic hymns of creation,"

12. *Mysticism and Catholicism* (London: T. F. Unwin, 1925), p. 31, cited by Radhakrishnan.

13. See Garbe, *op. cit.*, pp. 33–37, 53–55.

says Radhakrishnan, "will note that the conceptions of night and chaos and the birth of love, as well as that of the cosmic egg, are accepted by the Orphics."[14] Writing about the Orphic verses inscribed on a number of thin gold plates from Thourioi and Petelia, the earliest documents of Orphism to which we have access and which "belong to a time when orphicism was a living creed," Professor John Burnet says: "The doctrine has a startling resemblance to the beliefs which were prevalent in India about the same time, though it seems impossible that there should have been any actual contact between India and Greece at this date."[15] This statement is valuable for its first part, which admits the startling resemblance; but the second part is questionable in two respects: first, the beliefs were prevalent in India not merely "about the same time" as the date of the gold plates but many centuries before; second, it is wrong now to deny the possibility and even the probability of contact between India and Greece at the time. Radhakrishnan's comment on Burnet's statement clinches the issue. He says: "The beliefs held in common are those of rebirth, the immortality and godlike character of the soul, the bondage of the soul in the body, and the possibility of release by purification. If we add to them metaphors like the wheel of life and the world egg, the suggestion of natural coincidence is somewhat unconvincing." He adds in a note: "There are certain striking resemblances in the matter of the passage to heaven. In the *Rig-Veda* heaven is the home of the soul to which, after death, it returns purified (X. 14. 8); before reaching heaven it has to cross a stream (X. 63. 10) and pass by Yama's watchful dogs, 'the spotted dogs of Saramā' (X. 14. 10)."

Closely akin to Orphism was the Eleusinian cult, which used the Orphic hymns and was in essence more magical than ethical. If the ritual is correctly performed, the great goddess will protect the performer here and hereafter—a doctrine basically the same as that of the Vedic sacrifice. The theoretical background is the same as in Orphism. Divinity dwells in man wrapped in darkness; initiation into the cult, regarded as a second birth, and correct performance of ritual secure the recovery of our true self. At the end of the initiation, the initiate is urged to go in peace—which recalls the Upanishadic refrain: "Sāntih, sāntih, sāntih." Aristotle noted: "The initiated are not supposed to learn

14. *Op. cit.*, p. 138.

15. *Early Greek Philosophy* (London: A. & C. Black, 1908), p. 88.

anything, but to be affected in a certain way and put into a certain frame of mind." Not all who entered benefited in equal measure or grasped the full meaning of what they saw and heard at the ceremonies. But these mystic cults were favored by the tragic poets of Greece and were popular in considerable measure until they were banned by Christian emperors.

The Orphic doctrines were taken up by a man of genius, Pythagoras of Samos, who went to Italy and settled at Croton, where he was well received. His dependence on Indian philosophy and science is clear from the facts that the Greeks themselves regarded his doctrine as foreign and that, since Sir William Jones first pointed out the analogies between the Sāmkhya system and Pythagorean philosophy and Colebrooke underlined them, the consensus of modern scholarship has accepted this as a settled fact. Pythagoras taught in the second half of the sixth century and looked upon Orpheus as his chief patron. The universe is, for Pythagoras, not only a proportioned order but a *harmonia* or "being in tune." He enjoined the ascetic way of living in which abstention from meat was an essential requirement. He believed in rebirth, and there are stories attesting his capacity to remember his former births and to identify those of others. He also believed in the purification of the soul by successive higher births. Plato affirms that the Pythagorean way of life was still known in his day. The Pythagorean order was a religious brotherhood recruited by voluntary initiation. In the *Phaedo* Plato refers to the Pythagorean doctrine that men are strangers to the world, that the body is the tomb of the soul, and that escape from it by suicide is wrong. Contemplation is held to be the end of man, as it leads to purification of the soul and cessation of births. Like the *Upanishads,* Pythagoras held that the distinction between human and other kinds of being is not ultimate and that all souls are similar in kind. His biographer, Iamblichus, states that Pythagoras held that the sun and the moon were the islands of the blest; the moon is mentioned in the *Upanishads* as the abode of spirits. He also says that Pythagoras traveled widely, studying the teachings of the Brahmins, among others, and that he was also a mathematician and expressed his ideas of cosmogony in mathematical terms. He was "a rare combination of high intellectual power and profound spiritual insight" (Radhakrishnan). In later times his followers divided into a rationalist school and a religious school. Direct influence from India on the thought of Pythagoras has been generally accepted as a quite possible and necessary

postulate. Thus Gomperz writes: "It is not too much to assume that the curious Greek, who was a contemporary of Buddha, and it may be of Zoroaster too, would have acquired a more or less exact knowledge of the East in that age of intellectual fermentation, through the medium of Persia."[16] And commenting on the suggestion of Herodotus that Pythagoras got the doctrine of rebirth from the Egyptians, H. G. Rawlinson says: "It is more likely that Pythagoras was influenced by India than Egypt. Almost all the theories, religious, philosophical, and mathematical, taught by the Pythagoreans, were known in India in the sixth century B.C., and the Pythagoreans, like the Jains and the Buddhists, refrained from the destruction of life and eating meat and regarded certain vegetables such as beans as taboo."[17] He adds: "It seems also that the so-called Pythagorean theorem of the quadrature of the hypotenuse was already known to the Indians in the older Vedic times, and thus long before Pythagoras" (*sulbasūtras*). Many scholars are of the same view, though A. B. Keith differs from all of them and is somewhat hypercritical.[18]

The mystic tradition continues in Socrates (470-399 B.C.) and finds its full expression in Plato (427–347 B.C.). Socrates was a great advocate of rational self-discipline, but he was also a deeply religious man. Eusebius (A.D. 315) has preserved a tradition attributed to Aristoxenus, a writer on harmonies (*ca.* 330 B.C.), that some learned Indians actually visited Socrates in Athens, asking him to explain the aim of his philosophy. When he replied: "An enquiry into human affairs," one of his visitors burst out laughing. "How," he asked, "could a man grasp human things without first mastering the divine?" Rawlinson justly observes: "If Eusebius is to be believed, we must revise many of our preconceived notions about early intercourse between the two countries."[19] Such stray references, vague and legendary as they sometimes are, seem, when studied carefully, to bear out on the whole that the contribution of distant India to Greek thought even in these early times was by no means negligible.

The echoes of Upanishadic thought in Plato's dialogues are too

16. *Greek Thinkers,* I, 117, cited by Radhakrishnan.

17. *Legacy of India* (1937), p. 5.

18. *JRAS,* 1909, pp. 569 ff.

19. *Indian Art and Letters,* X (1936), 57–58. Aristoxenus is confirmed by a fragment of Aristotle (Radhakrishnan, *op. cit.*, p. 151 and n.).

numerous to be detailed here, and the curious reader may gain some fair idea of it from the pages of Radhakrishnan's *Eastern Religions and Western Thought* (pp. 144–48). We may point out that the Orphic legend of the universe as formed in the body of Zeus after he had swallowed Phanes, the offspring of the great "World Egg," in whom all the seeds of things are present, is too close to the Indian account of creation for the similarity to be accidental. Attention may be called to the Hindu theory of *varnas* and the division of the classes in the ideal polity of Plato's *Republic* into Guardians, Auxiliaries, and Craftsmen. The story that Socrates proposes to tell of their divine origin, in order to perpetuate the system—"otherwise the state will certainly perish"—is clearly very close to the Vedic myth about the origin of the four castes found in the Purusha-Sūkta of the *Rig-Veda*. The contrast between the Greek spirit in general and the lines of Plato's thought has often been noted by reputed scholars. Sir Richard Livingstone has observed: "Plato is the most eminent representative of the heretics"; again, more explicitly, Stutfield says: "The mind of Plato was heavily charged with Orphic mysticism mainly derived from Asiatic sources. India, always the home of mystical devotion, probably contributed the major share."[20]

Alexander had perhaps a vague idea of India's religious men and thought even before he started on his Indian adventure. While at Taxila he sent Onesicritus, a disciple of Diogenes, to the sages who were living in a neighboring forest, and he succeeded in persuading an ascetic called Kalanos (Kalyāna?) to join Alexander's entourage. Pyrrho, who accompanied Alexander to India, acquired a knowledge of Indian thought and to him has been traced the simile of the rope and the snake, celebrated in Indian philosophy, found in Sextus Empiricus and nowhere else in Greek or Latin literature. Pyrrho was the founder of the Sceptic system.[21] Alexander was accompanied, indeed, by several scientists and men of action who, in the midst of their military preoccupations in a hostile country, succeeded in gathering a considerable knowledge of the Indian peoples, their habits and industries, and left writings which marked a decided advance of European knowledge of the East. Even more important in this respect were the ambassadors of

20. Both cited by Radhakrishnan, *op. cit.*, pp. 148–49, n. 1.

21. S. J. Warren, "Het Slang en Truw-Voorbeeld big 'Sextus Empiricus en in Inde,'" *Versl. en. Med. der Kon. Akad. van Wetenschappen, Amsterdam*, IV, ix, pp. 230–44.

the Hellenistic kings who came after Alexander and maintained friendly relations with the great Mauryan emperors of India. Megasthenes is the best known among these ambassadors, and the fragments that have survived of his work on India have been closely studied with notable results. Had Alexander lived to a normal old age, his dream of the marriage of Europe and Asia, to which he gave concrete expression by his own marriage with the Sogdian princess Roxana, and by the marriages to Asian brides of a hundred superior officers of his army and ten thousand of his humbler followers, might have borne some tangible results in the development of Eurasian culture. Even as it was, the old isolation of the city-state with its narrow loyalties began to give way to incipient oecumenical ideas of the individual's place in society and of the brotherhood of man, where there would be known neither Greek nor barbarian. Zeno, the founder of Stoic philosophy, adumbrated the vision of a world as one great city under one divine law. In this context it may be worth recalling that ideas of universal rule and a world empire ruled by a *chakravarti-sārvabhauma* had been cherished in India at least from the later Vedic times (*Aitareya Brāhmana*), and in actual history the Mauryan Empire came very close to satisfying the legendary aspirations of its people for a united Bhāratavarsha.

The Mauryan Emperor Asoka diligently preached the gospel of the Buddha to the world. A council was held at Pātaliputra in the middle of the third century and resolved to send missionaries throughout the world to preach the new teaching. These missions, to judge from Asoka's own edicts, were evidently well received in the five Hellenistic states of Syria, Egypt, Macedon, Cyrene, and Epirus, and they must have focused the attention of these lands to some degree on the ideas they propounded. Stones bearing the Buddhist symbols of the wheel and trident have been found in Egypt, and Indian mold figurines dating about 200 B.C. have been discovered in Memphis. Petrie has accepted this as evidence of an Indian colony existing in Memphis at that date—one which seems to have had a more or less continuous existence from about the fifth century B.C., as Petrie himself came to think in the light of further evidence. He says: "There is no difficulty in regarding India as the source of the entirely new ideal of asceticism in the West."[22] The

22. "Stones with Buddhist Symbols," *JRAS*, 1898, p. 875; W. M. Flinders Petrie on Indian colony at Memphis, *Man*, Vol. VIII, No. 71 (1908); *Memphis* (1908), chap. vii. Also *Egypt and Israel* (New York: E. S. Gorham, 1911, 1923), p. 134, cited by Radakrishnan, *op. cit.*, p. 150.

embassies from the Hellenistic states to India, to which brief reference has been made, must have been another factor which promoted the traffic in ideas.

In one way and another Indian religious ideas and legends seem to have been well known in the circles in which the accounts of the Gospels originated. The "Scrolls of the Dead Sea" discovered in 1947, which have been examined as yet only in part and whose study promises to occupy scholars for many years to come, seem to indicate that many of Christ's teachings, sometimes his very words, were current at least some fifty years before he was born.[23] The "Community of Covenanters" settled at Khirbet Qumran on the western shore of the Dead Sea between 100 B.C. and A.D. 70, from whose extensive library the scrolls come, were most probably Essenes or at any rate closely related to them and living in the same region. The doctrines and practices of the covenanters lead to an enlarged understanding of the Judaism of the Roman period. "The tree whose trunk was the Old Testament had then many branches which later were lopped off or withered away." Christ's teaching is seen more and more to be a blend of concepts derived both from Judaism and the East, particularly from Buddhism in one form or another. Earlier Judaism, even, was not quite free from Indian or more generally Eastern influences. The Book of Enoch is a remarkable Hebrew work of the first century B.C., full of non-Judaic speculations which anticipate some of the central features of Jesus' teachings. R. Otto, studying the analogies with Eastern thought, finds their source in the *Kaushītaḳi Upanishad*.[24] The Essenes and other allied sects are filled with the spirit of Buddhism. Though Jews by birth, the Essenes abjured marriage, practiced a form of communism in worldly goods, abstained from temple worship, and objected to animal sacrifices. They were strict vegetarians and drank no wine. They refrained from trade, owned no slaves, and made no weapons of war. Admission to the sect involved an elaborate initiation and solemn oaths. John the Baptist was an Essene, and his insistence on baptism was in accord with the practice of the Essenes. Jesus was influenced greatly by their tenets, even if he was not one of them for a time, as some are inclined to believe. His emphasis on non-resistance to evil may be due to the Essenes. Even in

23. Millar Burrows, *The Dead Sea Scrolls* (New York: Viking Press, 1955). Also Kingsley Martin, "New Light on Old Testament," *Hindu*, December 11, 1955.

24. Radhakrishnan, *op. cit.*, pp. 160–61.

the central conception of the Kingdom of Heaven two elements have been identified: one, a messianic conception belonging to the Palestinian tradition, and the other a mystic conception derived from the description of release in the *Upanishads*. "Though Jesus' teaching is historically continuous with Judaism, it did not develop from it in its essentials";[25] it took in much from the East.

The entire Gospel story, in fact, bears striking resemblance to the life and teachings of Gautama Buddha, for example, the Buddha's miraculous conception and birth; the star over his truth place; the prophecy of the aged Asita, the Buddhist Simeon; the temptation by Māra; the twelve disciples with "beloved disciple" Ānanda; and the miracles, together with the Buddha's disapproval of these as proofs of his Buddhahood. "More startling still," as Rawlinson observes, "are the points of similarity between the Buddhist and Christian parables and miracles." *Jātaka,* No. 190, mentions a pupil of the Buddha who walked on water when he was filled with faith in the Buddha, but who sank when the faith faded. As Max Müller pointed out, walking on water is not an uncommon story; but walking by faith and sinking for want of it can be accounted for only by some historical contact, and the *Jātakas* are centuries older than the Gospels. In another *Jātaka* (No. 78) the Buddha feeds his five hundred brethren with a single cake which has been put into his begging bowl, and there is much left over that has to be thrown away. Equally striking is the similarity of Roman Catholic service and ceremonial to the Buddhist. Sir Charles Eliot observes: "When all allowance is made for similar causes and coincidences, it is hard to believe that a collection of practices such as clerical celibacy, confession, the veneration of relics, the use of the rosary and bells can have originated independently in both religions."[26] Buddhism was a long-established religion with a tradition and institutions of its own when Christianity was still in its formative stage.

In India itself the Mauryan period of grandeur and unified culture was followed by one of problems and foreign intrusions. At first there was the invasion of the Northwest by the Greeks of Bactria, who established several Indo-Greek colonies and principalities. Then came successive waves of nomadic peoples displaced by a violent whirlpool

25. *Ibid.*, p. 176. The whole section from which the citation is taken seeks to demonstrate this conclusion in detail and must be read.

26. *Hinduism and Buddhism* (1921), III, 443.

of events in the Chinese borderland of Central Asia. These, however, soon raised themselves up and established, about the beginning of the Christian Era, "a great Indo-Scythian empire which united with West India the Afghanistan of to-day and a part of Central Asia in one extensive imperial state. Adopting in India (like the Greeks before them) the culture of the country and the Buddhist religion, they ensured the dissemination of both, not only in the rest of the empire, but also the High Asiatic routes which ran towards China" (Filliozat). This was the state of the Indian world at the time of the formation of the Roman Empire.

The Greeks who settled in India in considerable numbers after the Bactrian invasions rapidly became Indianized. The extent of the process is very well attested by a Brāhmī inscription of the second century B.C. found engraved on a stone pillar at Besnagar, near Bhilsa (railway station) in central India. The inscription reads: "This *garuda* column of Vāsudeva (Vishnu) was erected here by Heliodorus son of Dion, a worshipper of Vishnu (Bhāgvata) and an inhabitant of Taxila, who came as a Greek ambassador (*Yonadūta*) from the great king Antialcidas to king Kāsīputra Bhāgabhadra, the Savior, then reigning prosperously in the fourteenth year of his kingship."[27] We have a Kharoshthī inscription of the early part of the first century B.C. engraved on a vase from Swat by the Greek meridarch Theodorus, who was a Buddhist and enshrined some relics of Buddha.[28] In the Näsik and Karla caves are many votive inscriptions in Brāhmī by Greek colonists settled in the neighborhood. Menander, in some ways the greatest of the Indo-Greek kings, was converted to Buddhism by Nāgasena (180–160 B.C.), and the Pāli work *Milindapanha* purports to be a record of the dialogues between the king and the teacher. The Indo-Greeks are thus seen to have embraced Hinduism or Buddhism as they desired.

How far did this second and more long-standing contact (as contrasted with the passing episode of Alexander's inroad) with the Greeks affect the civilization of northwestern India? Probably the effect was not great, and the adoption of Indian religions by the Greeks favors this view. The coins of Demetrius are purely Hellenic; but those of Menander are an interesting compromise between Greece and India. Menander's capital, Sāgala, has left no trace, and we cannot say how

27. *JRAS*, 1909, p. 1092; Radhakrishnan, *op. cit.*, p. 156.

28. Smith, *Early History of India* (1924), p. 255, n. 1.

far it followed the Greek style of town planning. Foucher has held that the idea of representing the Buddha as a man in sculpture originated with the Greeks; this may be correct, although several Indian scholars reject the view and hold that the idea was evolved independently at Mathurā and that the Yaksha primitives of this and other art centers were the forerunners of the later Buddha statues. Though they may be correct about the style of the Indian (non-Gandhāra) Buddha images, this does not seem to invalidate Foucher's view that the *idea* of representing Buddha (or, indeed, any deity) in human form originated with the Greeks. All early Buddhist sculpture indicated the presence of the Master only by symbols—the bodhi tree, footsteps, *stūpa,* etc. Once the idea started in the northwest, it could easily have traveled to Mathurā along the busy trade routes that connected Mathurā with Taxila, Peshawar, and other places in Gandhāra. W. W. Tarn's estimate of the question is worth citing: "Indian civilization was strong enough to hold its own against Greek civilization, but, except in the religious sphere, was seemingly not strong enough to influence it as Babylon did; nevertheless we may find reason for thinking that India was in certain respects the dominant partner."[29] Again: "Considered broadly, what the Asiatic took from the Greek was usually externals only, matters of form; he rarely took substance—civic institutions may be an exception—and never spirit. For in matters of the spirit Asia was quite confident that she could outstay the Greeks, and she did."[30] These remarks find striking confirmation in the Sītābanga and Jogimāra caves in the Rāmgarh Hills, 160 miles due south of Benares. They contain a curious open-air theater and another indoors, the plan of which has been thought to be of Greek inspiration, as well as inscriptions of the third or second century B.C. recording the name of Sutanukā, a hetaera, and the provision of a resthouse for actresses. But Indian drama is in its essentials Indian in origin and spirit, and its roots are to be sought in the age of the Vedas and Brāhmanas. Words like *yavanikā,* for "curtain," again are only evidence of Indians borrowing the external forms from elsewhere without in any way altering the spirit of their institutions. The exception which Tam has made with regard to civic institutions finds its justification in the celebrated *Arthasāstra,* its author

29. *The Greeks in Bactria and India* (Cambridge: Cambridge University Press, 1938), pp. 375–76.

30. *Ibid.*, p. 67.

Kautilya avowing that he consulted not only the ancient treatises of his own country but the current practice of contemporary (Hellenistic) states before composing his great work.[31] And the high quality of Mauryan sculpture may have owed something to Hellenic, besides Iranian, factors.

The rise of the Roman Empire made for more frequent contacts between India and the West. We need not repeat the well-known historical details of these contacts—the embassies, the articles of trade, etc. But we must note that *Pax Romana* promoted the growth of a cosmopolitan culture in the Near and Middle East. In Antioch, Palmyra, and Alexandria, Indian and Greek merchants and men of letters met freely to exchange ideas. A coin of Menander with one of Vespasian found at Tenby in Pembrokeshire invoke the vision of a Greco-Roman merchant visiting both India and Britain in the pursuit of trade. Other North Indian coins and their imitations have been found in Scandinavia, and there are relics of Eastern trade along the Oxus-Caspian route.[32]

Alexandria was the second city in the Empire.

> The mercantile shipping of half of the ancient world tied up at her quay-sides, and scholars from the four quarters of the earth met and disputed in the Museum, and made use of the vast stores of literature in her great libraries. They had none of the contempt for the "barbarian" of the old Greek city states, and a large proportion of the population, like the Athenians, "spent their life in nothing else, but either to tell or hear some new things . . ." . The *Milinda Panta* mentions Alexandria as one of the places to which Indian mercants regularly resorted, and Dio-Chrysostom, lecturing to an Alexandrian audience in the reign of Trajan (A.D. 98–117) says: "I see among you, not only Greeks and Italians, Syrians, Libyans and Cilicians, and men who dwell still more remotely, Ethiopians and Arabs, but also Bactrians, Scythians, Persians and some of the Indians, who are among the spectators and are always residing there."

As a result, Indian philosophy gained a growing recognition in the Hellenistic schools of Asia Minor and Egypt. Apollonius of Tyana (*ca.* A.D. 50), famous Gnostic and a miraclemonger, went to Taxila to study under Brahman preceptors. Bardesanes the Babylonian (b. A.D. 155), a well-known Gnostic teacher, learned many curious facts about India from an Indian embassy which came to Syria in the reign of Elagabulus

31. See M. Rostovtzeff, *Social and Economic History of the Hellenistic World* (Oxford: Clarendon Press, 1941), pp. 550–51.

32. E. H. Warmington, *The Commerce between the Roman Empire and India* (Cambridge: Cambridge University Press, 1928), p. 302. This book and Rawlinson's *Intercourse* are the best studies of the whole subject.

(A.D. 218–22). He learned much from the Indian gymnosophist Dandamis, who came with the embassy and knew a great deal about Brahmans and Buddhists and their discipline and way of life. He described accurately life in a Buddhist monastery and a visit to a cave temple in western India containing an image of *ardhanārīsvara,* Siva in his androgynous form. The work of Bardesenes on the Indian gymnosophists is lost; but two precious fragments of some length have been preserved by Porphyry (A.D. 233–305) and Stobaeus (*ca.* A.D. 500).[33]

Buddhism was known to Clement of Alexandria (A.D. 150–218), who often refers to the presence of Buddhists in Alexandria and declares that "the Greeks stole their philosophy from the barbarians." He is the first Greek writer to mention the Buddha by name. "There are some Indians," he says, "who follow the precepts of Boutta whom by an excessive reverence they have exalted into a God." He knows that the Buddhists believe in transmigration and "worship a kind of pyramid (*stūpa*) beneath which they think the bones of some divinity lie buried." He distinguishes clearly between Buddhist and Brahman, unlike earlier writers who confuse them.

Archelaus of Garrah (A.D. 278) and St. Jerome (A.D. 340) both mentioned Buddha by name and narrate the tradition of his virgin birth. The Buddha story became gradually known in the West, until, by a coincidence hardly to be paralled in literature, it was narrated in the eighth century A.D. by John of Damascus as the life of a Christian saint. Under the guise of Saint Josaphat, Guatama the Bodhisattva found his way into the Christian church, and was included in the Martyrology of Gregory XIII (1582).[34]

The Therapeutae or the Contemplative monks of Egypt, who are mentioned with enthusiasm by Philo (A.D. 20), were definitely under the influence of Hindu and Buddhist thought in their ascetic life, in their mortification of the body, and in their devotion to pure contemplation. Their name resembles closely Theraputta, which may be a Pāli word meaning a "group of Theras"; the Theras or Sthaviras (Skt) were one of the celebrated schools of early Buddhism. Philo developed in Alexandria a new interpretation of Jewish scriptures with the doctrine of the Logos as its central and determining feature. The earlier and later affiliations of the doctrine have been mentioned above.

Gnosticism was a conscious effort to fuse Greek and Hindu elements

33. John Watson McCrindle, *Ancient India* (Westminster: A. Constable & Co., 1901), pp. 119–74.

34. Rawlinson, *Intercourse,* p. 142.

of thought, to which Christianity was added later. It is a syncretic system starting well before the Christian Era, though Christianity tended to consider it a heresy. It had much in common with the *Upanishads* and the mystic tradition of Greece. "Gnosis" does not mean intellectual understanding, but rather seeing God, mysterious wisdom, the beatific vision, illumination—call it what you will. Without going into the details of the system, we may cite the most concise and expressive estimate given by Kennedy of Gnosticism in its relation to Indian thought: "Gnosticism is not pure Hellenism as some say; it is rather pure orientalism in a Hellenic mask."[35] Basilides, the great Gnostic teacher and contemporary of Hadrian (A.D. 117–38), definitely worked Hindu and Buddhist thought into the framework of Christianity. Like the Buddha, he is a pessimist: "Pain and fear are inherent in human affairs." He was a firm believer in transmigration and in karma; his theory of personality has strong Buddhist affinities: "The soul is without qualities, but the passions, like the Buddhist *skandhas,* attach themselves to it as appendages or 'parasites.' God is unpredictable, almost non-existent, and the divine entity of Jesus at death alone passed into Nirvāna." Basilides believed that Christianity was the chief element in his system, but his interpretation is profoundly Buddhist. To quote Kennedy again: "All things have their law of being in themselves; suffering is the concomitant of existence, rebirth is the result of former acts and metempsychosis governs men with inflexible justice and with iron necessity. The Office of Jesus is the office of the Buddha; the elect alone are saved and the mass of mankind remains content to be born again. 'It is Buddhist pure and simple, Buddhist in its governing ideas, its psychology, its metaphysics.' "

Plotinus, founder of the Neo-Platonic school, was eager to be instructed in Indian philosophy and accompanied the expedition of Gordian against Sapor, king of Persia, in A.D. 242, hoping to come into personal contact with someone who could help him. Neo-Platonism closely resembles the Vedānta and Yoga systems of India. Plotinus, describing the absorption of the individual into the world-soul in a truly Indian way, said: "Souls which are pure and have lost their attraction to the corporeal will cease to be dependent on the body. So detached they will pass into the world of Being and Reality." Like Buddhism, Neo-Platonism also enjoins abstention from animal sacrifices and even animal food.

35. "Buddhist Gnosticism," *JRAS,* 1902, p. 383.

In Neo-Platonism may be said to have culminated the results of the syncretism of religions which arose from the conquests of Alexander and the establishment of the Roman Empire. Porphyry (A.D. 230–300) popularized the teachings of Plotinus. For him the central aim of philosophy, as for all Indian systems, is the salvation of the soul, and he enjoins strict asceticism for the attainment of this end. A few years before Plotinus established himself in Rome in A.D. 245, Hippolytus, bishop of Ostia (A.D. 230), in his work *Philosophumena,* or *Refutation of All Heresies,* gave a succinct account of the doctrines of the Brāhmanas who dwelt on the banks of the Tagabena (Tungabhadrā) in the Daccan, which tallies very well with the doctrines of the *Upanishads.* This is striking proof of real contacts and precise knowledge in the third century A.D., the nature and occasion of which cannot yet be fully worked out from known data. Filliozat observes with truth: "The craze that one finds in the Roman Empire for oriental sages, and in particular Indians, is not pure snobbishness; it corresponds to a historic acquisition of varied information, by many, but quite fixed routes, which we also know were quite regular." It is perhaps needless to follow the influences of Indian thought on other Neo-Platonists and on the early Christian writers like Dionysius the Areopagite, Clement, Origen, and even Augustine.[36]

Athanasius (and the Council of Nicea) weaned the church from her traditions of tolerance and scholarship of Clement and Origen.

We may now revert for a moment to the effects of Western contacts on Indian civilization. In the general peace of the Roman Empire, nascent Christianity met full-grown Buddhism in the markets and academies of Asia and Egypt, and the ancient Zoroastrianism of Persia as well as the surrounding polytheistic paganism of the different countries affected both the religions and contributed to their transformation. The new ideas that came to the front in such an atmosphere had no small share in effecting the great changes that converted Hīnayāna Buddhism into the Mahāyāna in which "the veneration for a dead Teacher passed into the worship of a living savior." The Kushāna Empire, particularly of the time of Kanishka, when a great Buddhist Council was held, played a large part in the conversion, and the currency of Kaniṣhka's reign reflects the influences of all the forces at work in accelerating a

36. For Hippolytus see Filliozat, *op. cit.,* pp. 27–28; for the other writers, Radhakrishnan, *op. cit.,* p. 219.

process that had begun a long way back. The Buddhist sculpture of the Kushāna period belongs mostly to the Gandhāra school; we have already commented on the origin of the Buddha image in sculpture.

The eastward advance of the Roman frontier in the days of Trajun and Hadrian (A.D. 98–138) was favourable to the spread of Hellenistic ideas and artistic forms in India and other Asiatic countries. The Indo-Greek artists found their inspiration in the schools of Alexandria, and of Pergamon, Ephesus, and other places in Asia Minor rather than in the works of the earlier artists of Greece. In other words, the Gandhāra style is Graeco-Roman, based on the cosmopolitan art of Asia Minor and the Roman empire as practised in the first three centuries of the Christian era.[37]

The relic casket of Agesilaus, the overseer of works at Kanishka's *vihāra* in Peshawar, is shaped like a Greek lady's jewel casket, though the figures in it are roughly and clumsily executed.[38]

The Kushāna coinage corresponded closely to the Caesarian aurei in weight and in fineness and was minted for the most part from imported Roman coins melted down for the purpose. The Kushāna emperors took the title of Caesar among others. In Peninsular India, on the other hand, the Roman aurei circulated as currency, much as the British sovereign did in the last century. The exclusively Greek legends on the coins of Kanishka and his successors should not be taken to imply a popular knowledge of the Greek alphabet and may be due simply to the fact that the language was first reduced to writing in the Greek character. "The early medical knowledge as expounded by Charaka, Kanishka's physician, has been supposed to betray some acquaintance with the works of Hippocrates, but the proof does not seem to be convincing."[39]

The maritime commerce between South India and Europe attained notable proportions in the first and second centuries A.D., Roman subjects lived at Muziris, Kāvēripattinam, and other port towns, and Roman soldiers or policemen were employed in the capitals of the Tamil states for guarding palaces and patrolling streets at night.[40] We may mention some interesting finds of recent years which establish the scope and nature of the contacts by tangible evidence of an irrefragable character. First, we have an elaborately carved ivory statuette of a nude

37. Smith, *The Oxford History of India* (3d ed., 1958), pp. 154–55.

38. Marshall, in *JRAS*, 1909, pp. 1060 ff.

39. Smith, *op. cit.*, p. 159.

40. See K. A. N. Sastri, *History of South India* (1957), for details.

woman with two attendants found in the ruins of Pompeii in the year 1938, which was perhaps the handle of a mirror. The workmanship, the features, and the ornamentation are unmistakably Indian, and the article must have reached Italy before A.D. 79, the date of the destruction of Pompeii by an eruption of Vesuvius.[41] Next comes the excavation in 1945 of an Indo-Roman trading station on a site near Pondichery, the Poduke, of Ptolemy, which contained definitely datable Italian pottery of the first century B.C.–A.D., particularly two-handled jars or amphorae characteristic of the Mediterranean wine trade of the period, together with Roman lamps and glassware.[42] Let us add that objects of Syrian provenance of about the same period have been found at Begram (Kāpisi) to the south of the Hindu Kush and that a gold coin of the Roman Emperor Antonius Pius (A.D. 138–61) has been found, together with a Buddha image of the contemporary Amarāvatī school in excavations at Oc Eo in Cambodia. What can be more striking confirmation of the Indo-Roman contacts by land and sea than these facts?

The next great epoch in the history of India is conventionally known as the age of the Guptas, although the Gupta empire at its broadest was confined to only a part of northern India. This period, which may be dated from the fourth to the seventh or eighth century A.D., was the classic age of Indian civilization, when literature and the arts attained their apogee and the external contacts of the country became both wider and more intensive in character on all sides. The overthrow of the Great Satraps (Muhākshatrapa) of Gujarat by Chandragupta II at the close of the fourth century not only put an end to the last vestige of foreign rule on Indian soil but also opened the Gangetic provinces to intensive maritime contacts with the Western lands. Writing early in the eleventh century, Alberuni cited the great thinkers and writers of this epoch as the best representatives of the broad and humanistic culture of ancient India which, in his own day, had become somewhat exclusive and intolerant. He mentioned the readiness of these thinkers to recognize merit among the thinkers of the Yavanas (Greeks) as a sign of their true cultural superiority. Mathematics and astronomy made great progress and were ready to profit by the example of Greek writers in these fields. Most famous and original among the Indian writers of the time was Āryabhata (b. A.D. 476), who devised the decimal system for the

41. Vogel in *Annual Bibliography of Indian Archaeology, 1938*, pp. 1–5.

42. *Ancient India*, July, 1946, pp. 17–124.

notation of numerals expressing tens, hundreds, etc., by position, employing a special sign for zero—"perhaps India's greatest legacy to the world in the sphere of practical knowledge," according to Smith. The next great writer, Varāhamihira, was deeply learned in Greek science and introduced many new technical terms from Greek astronomy. "The Ajanta frescoes record intercourse between western India and Persia early in the seventh century. Three missions to Roman emperors in A.D. 336, 361, and 530 are mentioned. The coinage bears unmistakable testimony to the reality of Roman influence, and the word *dīnāra,* the Latin *denarius,* was commonly used to mean a gold coin" (Smith). Some scholars claim to discern the subtle influence of Greek taste and Greek stage forms on Indian sculpture and theater of the period, although others are inclined to doubt this. Kosmas Indilopleustes, a monk of the sixth century A.D., was the last voyager from the West to India in ancient times.

The presence of an Indian colony in the valley of the upper Euphrates and its destruction by Christians early in the fourth century A.D. is attested by the Syrian writer Zenob. He mentions the existence of Hindu temples built by Indians settled in the canton of Taron to the west of Lake Van as early as the second century B.C. About A.D. 304 St. Gregory appeared before these temples, where, despite heroic defense on the part of the Indians, he defeated them and broke the two images of gods, twelve and fifteen cubits high.[43] Severus Sebokht, a teacher and titular bishop in a Christian monastery on the Euphrates, defended the Syrians against Greek arrogance in A.D. 662 by citing the example of the Hindus, of whom he said:

> Their subtle discoveries in this science of astronomy, discoveries that are more ingenious than those of the Greeks and the Babylonians, their valuable methods of calculation and their computing that surpasses description; I wish only to say that this computation is done by nine signs. If those who believe, because they speak Greek, that they have reached the limits of science should know these things they would be convinced that there are also others who know something.[44]

43. *JRAS,* 1904, p. 369.

44. D. E. Smith, *History of Mathematics* (Boston and New York: Ginn & Co., 1923), I, 166–67.

Milič Čapek

TOWARD A WIDENING OF THE NOTION OF CAUSALITY

I. THE ORIGINS OF CLASSICAL DETERMINISM

If we wish to speak of the widening of the idea of causality, we must first specify the exact meaning of this concept, the modification of which is now being considered by many contemporary philosophers and scientists. In order to shed light on the classical concept of causality, it is almost impossible to avoid approaching it from the genetic point of view. Without a historical perspective we have only a very limited understanding of the content of the classical concepts by which this philosophic as well as scientific tradition has been constituted. By showing the deep and tenacious roots of our belief in rigorous determinism, we shall better understand certain types of resistance which today are opposed to any attempt at making determinism more flexible.

It is no exaggeration to say that the belief in strict determinism is almost as old as Western thought itself. Without discussing the mythical belief in an impersonal "destiny" to which even the gods were sub-

Translated by Wells F. Chamberlin.

mitted, we find the first precise formulation of determinism in Democritus, when he writes: "All things are determined by necessity, things that have been, things which are, and things which are going to happen." Twenty-two centuries after Democritus, Laplace expressed the same conviction, based on a conception of the universe which does not differ essentially from that of Greek atomism:

> Given for one instant an intelligence which could comprehend all the forces by which nature is animated and the respective situation of the beings who compose it—an intelligence sufficiently vast to submit these data to analysis—it would embrace in the same formula the movements of the greatest bodies of the universe and those of the lightest atom; for it, nothing would be uncertain and the future, as the past, would be present to its eyes.[1]

It is true that there is a very important difference between the determinism of Democritus and that of Laplace. The latter possessed a conceptual apparatus far more complex and flexible than the former. This is only natural; in the interval of time which separated Greek determinism from modern determinism, there occurred two events, which were, moreover, very closely associated with each other: the discovery of infinitesimal calculus and the founding of classical mechanics. The laws of mechanics, especially the law of inertia and of the conservation of the quantity of motion and of energy, were only guessed at by the Greek atomists, and their precise formulation had to await the cosmological revolution of Copernicus and Giordano Bruno. It is still true, however, that Democritus insisted just as vigorously as did Laplace and the modern determinists on the absence of contingency in nature. It is also true that in other respects Democritus anticipated certain aspects of Newtonian physics, for example, the infinity and the homogeneity of space, as well as the qualitative unity of matter, its permanence, and its atomic structure. Thus we see the justification of the Meyerson thesis, according to which, philosophically speaking, the difference between Greek atomism and classical physics is one of degree and not of nature, which means that, given the close connection between the corpuscular models of nature and absolute determinism, the distinction between the "necessity" (ἀνάγκη) of Democritus and the "necessity" of Laplace is also a difference of degree.

Laplace's formula, so frequently quoted, has been expressed many times in more concrete and more colorful language, pointing out clear-

1. Pierre Simon, Marquis de Laplace, *A Philosophical Essay on Probabilities*, trans. F. W. Truscott and F. L. Emory (New York: John Wiley & Sons, 1902), p. 4.

ly that not only inorganic nature but also the most concrete details—and, in appearance, the most contingent details—of human history are only parts of the same network of universal necessity by which all effects are joined to their causes. According to Du Bois-Reymond, Laplacian intelligence would be capable of deducing the most insignificant details as well as the most important events of human history from its huge system of differential equations. It matters little if the events to be deduced belong to the past or to the future. The universal intelligence would know if the sky were clear or cloudy when Pericles embarked at Piraeus to go to Epidaurus; it would also know the exact future date on which the Orthodox cross would be raised over the Mosque of St. Sophia in Constantinople.[2] (We should bear in mind that the date of Du Bois-Reymond's lecture—1877—explains this belief in the inevitability of a Russian conquest of Constantinople.) It is obvious that, from the strictly deterministic point of view, social history is only a particular case of universal physical history. The human body, including the nervous system, is composed of the same elementary particles as inert matter, and, consequently, it obeys the same physical laws; thus Hippolyte Taine was merely consistent when in 1870 he wrote: "In supposing the science to be complete, we should arrive at a mathematical formula enabling us to sum up in some one law the different positions and relations of all the nervous particles."[3]

The idea of inescapable necessity even penetrated literature, where the theme of the inevitability of personal destiny and of all human thoughts and actions became very popular in the naturalistic and in the psychological novel. Let us mention just two examples: Tolstoi and Anatole France. The philosophic epilogue of *War and Peace* is pervaded by the same idea of universal necessity as the philosophic discourses of Dr. Socrates in the *Histoire comique,* when he insists that the whole cosmic past has, as it were, conspired to make M. Chevalier's suicide inevitable. "Even when the solar system was only a pale nebula with a radius a thousand times greater than that of Neptune," says Anatole France, speaking through Dr. Socrates, "the actions of all men, including this particular and tragic one of M. Chevalier, were already inexorably predetermined—for the human mechanism is only a special case of the universal mechanism."

2. E. Du Bois-Reymond, "Über die Grenzen des Naturerkennens," *Wissenschaftliche Vorträge,* ed. J. H. Gore (London, 1896), p. 38.

3. H. Taine, *On Intelligence,* trans. T. D. Hege (New York, 1871), p. 104.

However, it would be a serious mistake to think that rigorous determinism had never been associated with any philosophic system other than the mechanistic and materialistic ones. It is found just as often in the idealistic philosophers. What is seemingly even stranger is the fact that we find a formula just as intransigent as that of Laplace in one of the so-called defenders of human freedom, Immanuel Kant. In a rather little-known passage of his *Critique of Practical Reason,* Kant, long before Laplace, applied Laplacian determinism not only to the human body but also to the human intelligence:

> It may therefore be admitted that if it were possible to have so profound an insight (*so tiefe Einsicht*) into a man's mental character as shown by internal as well as external actions, as to know all its motives, even the smallest, and likewise all the external occasions that can influence them, we could calculate a man's conduct for the future with as great certainty as a lunar or solar eclipse; and nevertheless we may maintain that the man is free.[4]

This passage will seem less paradoxical if we remember that, according to Kant, the category of causality applies to the world of phenomena without any restriction—not only to the "external" phenomena which constitute the contents of our outward perception but also to the introspection, which is placed by Kant on the same phenomenal level as sensory experience. The question has frequently been raised as to what this famous "intelligible freedom," to which Kant alludes in the last words of the text just quoted, could be. For the moment we shall not discuss the question whether freedom is compatible with the denial of time, as Kant himself believed; but we shall return to this point later. Let us merely retain one very important fact: that, as far as the "phenomenal world," including human psychophysical nature, is concerned, Kant was as deterministic as La Mettrie, or any other materialist or mechanist. Even Johann Gottlieb Fichte, certainly one of the most intransigent idealists, did not hesitate to affirm predetermination and the complete predictability of all psychological states.[5] In an entirely consistent fashion, although it appeared to be somewhat disrespectful, Friedrich Paulsen, one of the founders of Neo-Kantism, applied the Laplacian explanation to the mind of his master himself, when he wrote that an

4. Immanuel Kant, *Kant's Critique of Practical Reason and Other Works on the Theory of Ethics,* trans. T. K. Abbott (London: Longmans, Green & Co., 1909), p. 193.

5. J. G. Fichte, *Die Bestimmung des Menschen, Sammtl. Werke* (Berlin, 1943), II, 182-83.

omniscient physiologist would explain . . . the author of the *Critique of Pure Reason* just as he would explain a clock-work. In consequence of this particular arrangement of the brain-cells and of their interconnections with each other and the motor nerves, certain stimuli exciting the retina and the tactile nerves of the fingers had to occasion certain movements, which are in no wise different from those of a writing-automaton or a music-box.[6]

It is quite clear that the doctrine of psychophysiological parallelism, according to which there is no interaction between the consciousness and matter, found another argument in its favor in the Kantian doctrine of causality. If the category of causality is applied to the whole phenomenal world, it must be applied to all motions of matter, including the molecular displacements in the cerebral tissue of Kant himself. Thus human freedom is denied by the Kantians and Neo-Kantians as effectively as by the materialists and the mechanists. The only difference between materialism and Kantism is that for the latter the physical world is only a world of phenomena, while for the former it is a reality in itself, a *Ding an sich*. But interaction between the consciousness and the brain is as radically eliminated by Kant and the Neo-Kantians as by the physiological psychology of the nineteenth century.

Curiously enough, even some of those who are opposed to the parallelist doctrine and who defend a kind of psychophysical interaction nevertheless accept the doctrine of absolute determinism. Hans Driesch, for example, although opposed to mechanistic explanations in biology, has nevertheless stressed that his *vitalism* is not to be confused with indeterminism. Moreover, in a passage in his principal work, *Die Philosophie des Organischen,* he has explicitly stated that the complete knowledge of a certain state of the physical world, added to the complete knowledge of all the states of all the entelechies at the same instant, would make possible for us the integral prediction of any future moment.[7] It is difficult to find a more convincing proof that rigorous determinism is not the exclusive domain of materialism or of naturalism. As we have seen, it can be combined with the idealistic doctrine or even with a vitalist interactionism.

It would be pointless to give more examples. What we have already said is sufficient to show that the doctrine of absolute necessity, which implies the integral predetermination of the future, represents a tend-

6. Friedrich Paulsen, *Introduction to Philosophy,* trans. F. Thilly (New York: Henry Holt & Co., 1912), p. 88.

7. H. Driesch, *Die Philosophie des Organischen,* p. 290.

ency which is present in idealism as well as in naturalism, at least in their classical forms.

A brief survey of the history of philosophy will show that this conclusion is not so paradoxical as it may seem. Rigorous determinism has appeared three times in the history of Western thought: in ancient Greece, in the Middle Ages, and in the science of Galileo and Newton. As we have already stated, it appeared for the first time in the system of Leucippus and of Democritus. By placing the name of Democritus beside that of Laplace, we have already indicated that the modern form of determinism differs only in degree from its classical form. Even if we take into account all the distance which separates the speculative atomism of the Abderite from the experimental atomism of Dalton and from the kinetic theory of gases, the agreement on all essential points obscures the differences of detail and even the difference of method. This difference of method is not so absolute as is often claimed. We must not forget the speculative origins of modern atomism and the influence ancient atomism has had on it. This influence was especially evident in the formative seventeenth-century period; everyone knows the historical bonds between Gassendi's atomism and that of Lucretius. But the influence of Democritus, that is, of the atomist whose system was not spoiled by the curious notion of the undetermined *clinamen,* was no less strong. The name *Democritus reviviscens* which Johannes Chrysostomus Magnenus gave to his book is certainly significant and expresses very well the idea of the return to classical atomism which inspired the physics of the seventeenth century. The global vision of reality is, on all essential points, the same in Greek atomism as in Newtonian physics: the universe is composed of little grains of homogenous matter which move according to strict laws. All diversity of nature is due to differences in *configuration* and in motion. Any *qualitative* transformation is only an appearance produced by the changes in position of particles which always remain the same. Any contingency and any novelty are merely illusions due to our ignorance. Thus it is scarcely an exaggeration to say that the first and the third forms of determinism differ only in details which, however important they may be for the historian of the sciences, are of secondary importance from the philosophical point of view.

In the period which separated Greek atomism and Newtonian mechanics, there appeared a second form of determinism which seemed to be completely different. This was the *theological determinism,* which

found its most striking expression in the doctrine of predestination. This form of determinism has certainly been no less rigid than the naturalistic determinism of the Greek and of the modern period. All the concessions—verbal ones, moreover—which have been made by theologians to the notion of human freedom were inspired by motives which were completely foreign to the doctrine itself. Human freedom, in the systems of Augustine, of Thomas, and of the Protestant reformers, is as incompatible with the doctrine of absolute predestination as the *clinamen* of Lucretius was with his mechanistic system. The modern doctrine of absolute necessity is, according to Professor Charles Hartshorne, the result of the "secret alliance" between naturalistic determinism and theological determinism.[8] An assertion of this kind is less surprising when we take into account the common historical origin of these two determinisms. We intend to show that this common source is the philosophy of Parmenides of Elea, whose decisive influence on the development of Western thought is probably without parallel.

The Eleatic origin of Greek atomism is generally recognized. It is known that Leucippus and Democritus, according to Windelband's picturesque expression, "broke Parmenides' sphere into little pieces" which move through empty space according to strict laws. Parmenides' principle of the permanence of Being became the principle of the conservation of matter of the atomists, who, on this point also, anticipated another discovery of modern science. It is true that there are important differences between Democritus and Parmenides. The latter is a monist, while the former was a pluralist. Parmenides denied all change; Democritus admitted at least the reality of change of position. But, despite these differences, there is a profound kinship. Democritus' atom is as permanent, that is, as uncreatable and indestructible, as Parmenidean Being. The quantity of matter which it contains always remains the same. Its essential quality, that is, its *plenitude,* remains as absolute and as immutable as the same quality in the Eleatic Being. If the atomists admitted change, they admitted it in its most innocuous form, that is, in the form of *change of place,* which affects neither the total quantity nor the quality of Being. The change admitted by the atomists is change in the spatial relations of atoms, that is, change which is only half-real. For the void of the atomists, although different from the pure non-

8. Charles Hartshorne, "Contingency and the New Era in Metaphysics," *Journal of Philosophy,* XXIX (1932), 429.

Being of Parmenides, does not have the same degree of reality as matter itself. Consequently, the changing of relations in the void is doubly removed from the *primordial* reality of the substantial *plenum*. Since the time of Democritus, change, as well as multiplicity, is admitted by philosophers; no one, not even Spinoza or Bradley, returned to static monism, as radical and as arrogant as that of the Eleatics. However, the influence of the latter was strong enough to induce most philosophers to regard change and plurality as semireal, that is, as not possessing the same dignity as the underlying Being which remains one and immutable. As Émile Meyerson has shown in his classical works, static monism has remained an ideal model which, although never attained, has inspired philosophic systems as well as scientific explanations.

The continuity of theological determinism with Eleatic philosophy is probably less known and less evident, but it remains no less real. Space does not permit us to give a detailed historical analysis; we shall merely sketch the essential points. What is certain is that the fusion of the idea of Good with that of One, proposed for the first time by Euclid of Megara, and later accepted by Plato and Plotinus, had a profound influence on the formation of Christian theology. In spite of all the differences between Neo-Platonism and the philosophy of Aristotle, the medieval idea of God has the same Eleatic traits. That is why all the eminent Christian philosophers, such as Augustine, Johannes Scotus Erigena, Anselm, and Thomas, identify God with Being, which is One, indivisible, and absolutely immutable—for no change, however insignificant it may be, is compatible with the supreme perfection and incorruptibility of the divine Being. We must not forget that all change, all development, all succession, were regarded by the Christian theologians—as they were, moreover, by the Jewish and Moslem theologians—in a completely Platonistic and Eleatic way, as a corruption unworthy of the absolute perfection of the supreme Being. If we read the first twenty-six questions of the *Summa theologica* of Thomas, we become sufficiently aware of the extent to which the attributes of his God are the attributes of the Eleatic Being. There is no doubt that the religious difficulties in what may be called "theological Eleatism" were very serious. It is almost moving to see Thomas struggling desperately between the biblical idea of a personal and acting God and the Greek idea of a God conceived as an immutable, metaphysical principle and to see him trying to breathe some life and warmth into the cold concept of

Greek metaphysics.[9] In identifying their God with non-temporal Being, the theologians had no other choice than to place his wisdom and his knowledge outside of time. His knowledge must be limited by time; it embraces in a single, indivisible glance the totality of past, present, and future events, which are past, present, and future only for our imperfect human intelligence. Thus omniscience implies foreknowledge, and foreknowledge implies detailed providence, and, consequently, predestination. Within the divine intelligence there is no succession; there is no unrolling of time. All is traced out in advance in the most minute details and cannot be changed. Answering those who ask if prayer for the intervention of the saints can change the eternal decision of God, Thomas says that, if there is a change, it exists only in appearance, because even prayer and the interventions of the saints have been foreseen by the omniscient God, and thus they form a part of total and indivisible predestination. Although this uncompromising doctrine was relaxed in the official semi-Pelagianism of the period which preceded the Reformation, it was taken up again with the same vigor by Luther and especially by Calvin and Zwingli.

The transition from theological determinism to modern naturalistic determinism was not a sudden one. The most important transitional phases were the pantheism of Bruno and, a century later, that of Spinoza. In medieval theology pantheism was only virtual, although several eminent thinkers were coming close to it; but, as long as the duality of the world and of God remained preserved by the very structure of the Aristotelian world, that is, by the duality of the celestial world and the sublunar world, lurking pantheism could not become explicit. But when Giordano Bruno swept away the last sphere of the fixed stars, which was still retained by Copernicus, and when he thus proclaimed the unity of nature in the infinity of cosmic space, the way was open to the explicit and heretical pantheism which would replace the *Deus et Natura* of the Scholastics with the *Deus sive Natura* of Spinoza. We know the profound upheaval which this passage from medieval theism to modern pantheism produced in the sixteenth and seventeenth centuries. But we must not forget that the revolutionary character of modern pantheism was only apparent, because it was virtually present in the thought of theologians before the Renaissance. That explains why the God of Bruno and of Spinoza possessed the same Eleatic traits

9. See *Summa theologica*, Part I, particularly Questions IX, XVIII, XIX, XX, and XXII.

as the God of medieval theology and of Neo-Platonistic philosophy. "The divine Spirit," Bruno writes in his *Summa terminorum metaphysicorum,* "sees all things at once, in a single, simultaneous glance, that is, without distinction between past, present, and future; all things are present for it."[10] As in the preceding philosophical and theological systems, the notion of predestination followed inevitably from that of divine omniscience, but, in the thought of Bruno and of Spinoza, divine predestination was identified with the immanent determinism of nature. This was only natural—for nature and God are but two words for a single cosmic substance. Theological determinism, pantheized in this way, has found itself in natural agreement with the determinism of modern science, the fundamental principles of which were established at the same time. Let us not forget that Spinoza was a contemporary of Newton. After the deistic interlude, which was so unsatisfactory from the philosophical as well as from the religious point of view, God became the impersonal order of nature. Laplace's omniscient mind is only a metaphorical expression for the causal order immanent in nature, but we may also say that it is simply the God of Thomas and of Augustine secularized. Like the God of Christian theology, the "One" of Plotinus and the "Being" of Parmenides, it remains outside of time, outside of change, outside of duration. Let us remember this conclusion, which is of capital importance: the causal order of classical knowledge is a metaphysical entity which is outside of time and which thus implies a radical denial of succession.

II. SUPERFLUITY OF TIME IN THE DETERMINISTIC SCHEMA

Thus, if we accept strict determinism in all its consequences, we are faced with this question: Why do we have the appearance, or, if one prefers, the *illusion,* of time? What is the true place of succession in a strictly determined world? We have already emphasized the fact that no one after Parmenides had had the audacity to deny the reality of time and of change in such a complete and radical manner as the School of Elea had done. A rather curious compromise was generally preferred: becoming, instead of being completely denied, was banished only from the metaphysical realm of the true Being to be lodged modestly in the region of phenomena. In other terms, ultimate reality was placed outside of time while the true Being was almost always re-

10. *Jordani Bruno Nolani opera Latine conscripte* (Florence, 1889), i. 4. c. 14. 32, 33.

garded as static and immutable. It was only its phenomenal aspect—a surface aspect—which was considered as unrolling in time. It matters little if this true Being was the Sphere of Parmenides, the Matter of Democritus, the *Ens realissimum* of the medieval Scholastics, the Substance of Spinoza, the *Ding an sich* of Kant, the Unknowable of Spencer, the Absolute of Bradley, or the impersonal order of nature symbolized by the Universal Intelligence of Laplace—the conclusion always remained the same: time, change, succession, becoming, do not belong to "reality in itself" but to the semireal region of phenomena. Thus the dynamic aspect of reality was merely *reduced in rank,* or *weakened,* instead of being simply eliminated. Although time did not possess as authentic a reality as the immutable ontological background, it nevertheless existed *in some way,* although this manner of existence did not have the same dignity as the underlying Being. However, when one admits the dichotomy of "reality in itself," which is outside of time, and of the "Region of Becoming," in which phenomena succeed each other, he has merely stated the question without even attempting to solve it. Since Plato's time, the following question had been asked: Why is the real cut into two regions, that of the Immediate and Perfect and that of Change and the Imperfect? William James asked it in a concise and precise way in reference to Hegelianism, but his question also concerns all static monisms:

> Why, if one act of knowledge could from one point take in the total perspective, with all mere possibilities abolished, should there ever have been anything more than that act? Why duplicate it by the tedious unrolling, inch by inch, of the foredone reality? No answer seems possible.[11]

Although various explanations of the relation of the temporal and the eternal have been attempted, those who have done it have most often been satisfied with mere words. It has been compared to the relationship of the Perfect to the Imperfect, of the Original to its Copy; Aristotle would quickly have emphasized that such metaphors have no explanatory value and that the theory of the two regions of reality creates metaphysical difficulties instead of solving them. However, this judgment did not stop Aristotle from remaining more Platonic than he wished to, and, consequently, it did not stop philosophers from continuing to split reality in a more or less Platonic manner into two

11. William James, "On Some Hegelisms," *The Will To Believe and Other Essays in Popular Philosophy* (New York: Longmans, Green & Co., 1915), p. 271.

domains without explaining their relationship and, above all, without explaining the superfluity of the temporal. In the Middle Ages, while duality of the world and of God was maintained, the affirmation of the reality of the world involved the reality of time. But, when philosophers began insisting with Giordano Bruno and with Spinoza on the fundamental unity of God and of nature, the status of the temporal was inevitably weakened because the non-temporal eternity of the divine substance inevitably entailed the static eternity of the world. If people avoided this conclusion, it was for the purpose of avoiding the conflict with immediate experience which remains irreducibly temporal. At least it was admitted that temporal experience was real, even though it was illusory. But how can such an illusion be explained? How could static reality of which all the parts exist simultaneously, in a block, be deformed or mutilated into a fragmentary form of temporal development, without ceasing to be immutable? The proposed explanations were only apparent if they were not purely verbal evasions. Thus Spinoza establishes after Bruno the distinction between *Natura naturans* and *Natura naturata,* and he asserts that God, *insofar as he is infinite* (*quatenus infinitus est*), is completely different from what he is, *insofar as* he constitutes human intelligence. William James aptly observed that the main device of Spinoza's philosophy is in the word *"quatenus"*:

> Conjunctions, prepositions, and adverbs play indeed the vital part in all philosophies; and in contemporary idealism the words "as" and "quâ" bear the burden of reconciling metaphysical unity with phenomenal diversity. *Quâ absolute* the world is one and perfect, *quâ relative* it is many and faulty, yet it is identically the self-same world—instead of talking of it as many facts, we call it one fact in many aspects.[12]

It is obvious that such a reconciliation of non-temporal reality with its successive and changing appearance is purely verbal; but at least these philosophic prestidigitations, by their very vanity, reveal the impossibility of eliminating succession and change. The temporal character of experience is too authentic and too obstinate to be ignored, and the fact that even static monism in its most varied forms at least recognizes its "phenomenal," that is, its semireal, character without simply denying it, is very significant. It was only natural that scientists and even

12. William James, *A Pluralistic Universe* (New York: Longmans, Green & Co., 1909), p. 47.

philosophers inspired by science, and who, for that reason, were less obsessed with subtle metaphysical problems, did not hesitate to admit the reality of time, frankly and without reservations. However, they also believed, as late as the beginning of this century—and there are many who still believe it even today—that the authentically temporal character of the world is compatible with the most rigorous determinism. Is this true? Are temporality and determinism of the Laplacian type truly compatible? We are now facing the basic question of this article. Upon our answer will depend our attitude toward the general question of determinism and indeterminism, as well as our attitudes toward more special problems, such as that of freedom and of contingency in physical nature—the problem which today is at the center of the controversy over the interpretation of Heisenberg's indetermination principle.

At first glance, the question so stated seems strange and almost devoid of meaning because the answer given to it by common sense is completely clear and negative: there is no incompatibility between succession and strict determinism. From the days of the mythical belief in Destiny to the Newtonian concept of strict causality this answer has not varied. This is only natural. Nothing seems more familiar than the notion of the temporal process the phases of which, although strictly determined, are nevertheless successive. All classical scientific thought, not only in the physical sciences, but also in the biological and social sciences, is based on, or appears to be based on, the idea of the *necessary* connection of successive events. The association between the idea of succession and that of causality is so close and so familiar that, before the French contingentists and especially before Bergson, no one questioned their compatibility. Kant, followed on this point by many others, instead of questioning the compatibility of causal necessity and temporal succession, insisted on their ***inseparability;*** for him, the only way of saving freedom was to put it outside of time. Even after Bergson people continued to believe the same thing and were surprised if the question was raised. Consider what an American philosopher, Ralph Barton Perry, said in his critique of Bergson: "It is entirely possible to maintain the existential priority of time, and be a vigorous determinist as well." According to Perry, even a strictly determined mechanical system *ages,* although it ages according to a precise law. A simple motion of a material particle, of which all the future positions are predictable with

complete accuracy, contradicts, according to Perry, the Bergsonian assertion that temporal evolution and causal necessity are incompatible.[13]

There is no doubt that all the evidence appears to sustain Perry's views and those of his followers. This is especially true if one looks at classical physical science, but it is also true about today's biological and social sciences—for these sciences still remain pervaded by the spirit of classical physics. This is, moreover, only natural. Even among physicists today the question of the strict determination of phenomena is still being debated. Before discussing briefly the changes which have taken place in contemporary physics, we must first expose a serious difficulty which arises for all who claim that the necessary determination of events is compatible with their successive character.

What, then, is the precise meaning of the concept of necessary connection between two successive events? There is agreement on this point: if we affirm that event *b* follows necessarily after event *a*, we are affirming that all the particular traits of the former can be deduced from the latter; supposing our knowledge of a certain event to be complete, there would be no uncertainty even about the most individual and apparently most contingent details of any future event whatsoever. There is no point in quoting Du Bois-Reymond or Anatole France again. This is completely clear in Ralph Barton Perry's example concerning the motion of a material particle; it is obvious there that all the positions as well as the future velocities of the particle in question are predictable. But we know that, according to the determinists, there is in principle no difference between the causal determination of physical events and the necessity of historical events—there are only differences of complexity. It is only their complexity which makes the prediction of events in society so difficult. However, "social physics" does not differ essentially from physics conceived in its original sense. In the one as in the other, the present state implies, without any ambiguity, all future states.

However, by this very assertion, a determinist encounters a difficulty which, in my opinion, is insurmountable. It is known that any logical implication is *ex definitione* non-temporal. It is a commonplace in elementary courses of logic to distinguish logical implication, which is outside of time, from the psychological process of inference by which

13. R. B. Perry, *Present Philosophical Tendencies* (New York: Longmans, Green & Co. 1916), pp. 251–52.

we deduce a conclusion from premises. Although, psychologically speaking, the conclusion is *preceded* by the premises, that is, preceded in the temporal sense, it nevertheless remains true that, logically speaking, there is no succession, no unrolling, in the temporal sense of the word. And let no one be deceived by the ambiguity of the word "flow"; *there is no logical flow in the temporal sense of the word.* If we say that the conclusion "flows" from the premises, we are using this word only in the metaphorical sense. A logical antecedent is not a temporal antecedent; a logical consequence has nothing in common with temporal succession. The premises are not, in the temporal sense, *before* the conclusion, and, in the same way, the conclusion does not *follow* the premises in time. It is more exact to say that the conclusion *pre-exists* in the premises or that it is *contained* in them logically. We *discover* it after the premises in the actual process of human thought, but we do not *create* it by that process itself. The simultaneity of the conclusion with the premises can be illustrated in a convincing way by analyzing a form of classical syllogism: All men are mortal; Socrates is a man; consequently, Socrates is mortal. Or, in symbols: All *M* are *P;* all *S* are *M;* consequently, all *S* are *P*. It is obvious that the expression "consequently" has no temporal meaning. One is easily persuaded of this if he draws the famous Euler's circles, which symbolize the classes, or the logical extensions in question. Not only is class *M* contained in class *P* at the *same time* that class *S* is contained in class *M* but it is easy to see that class *S* is contained at the same time in class *P*. In other terms, the conclusion and the premises are *simultaneous*. The very possibility of symbolizing logical relationships of inclusion by spatial diagrams whose parts are, by their very nature, *juxtaposed,* therefore *simultaneous,* is the reason for this. For there is not a trace of succession in the relationship of inclusion, that is, in the relationship of container and contents. Unquestionably, every conclusion *coexists* in the logical sense with its premises, although it is *thought* and *pronounced* after the premises.

We must not confine our attention to one particular example of the traditional syllogism, for the pre-existence of the conclusion is postulated in every valid reasoning. That is why we say that we *discover* the truth, instead of saying that we *create* it. Just as in the classical syllogism the inclusion of class *S* in class *P* coexists with the two inclusions symbolizing the two premises, so in the solving of a mathematical equation,

for example, the "unknown" quantity is *determined in advance* without any ambiguity; thus it is *unknown only to us,* and we discover it in the same way that Columbus discovered America. We say that the solution is simply *waiting for* our discovery, that it exists, so to speak, before our discovery, just as the American continent existed *before* the voyage of Columbus. In the same way, if the future is determined in all its details and without any ambiguity, have we not the right to conclude with Laplace that it is already present and that it is merely waiting to be unveiled to our limited consciousness?

But, if that is true, the same question we have already asked arises again: *Where does the illusion of succession come from?* Why is the future unrolling of universal history not yet unrolled, although it is predetermined in all its details and although the present moment already contains it? If the future history of the universe pre-exists logically in the present, why is it not already here? Why does it require a certain interval of time to become actual, that is, present? Why is there this distance between "it will be" and "it is"? Why does the future require a certain time for its own realization, for its own "becoming present"? Where does this strange time lag come from, a time lag not at all justified by the structure of logical implication, all parts of which are simultaneous? For the average scientist such a question is even more difficult to answer, because for him time is as real as causal necessity; thus he does not permit himself to avoid the difficulty by the traditional expedient of philosophers such as Spinoza, Bradley, McTaggart, and others, who confine succession in the realm of phenomena while excluding it from reality itself.

The incompatibility of causal necessity with the fact of succession was fully emphasized by several French thinkers of the second half of the nineteenth century, such as Jules Lequier, Charles Renouvier, Émile Boutroux, Joseph Delboeuf, and, finally, Henri Bergson. Outside France, it was principally Charles S. Peirce and William James—the latter influenced, at least partially, first by Renouvier and later by Bergson—who insisted on the reality of objective contingency as an essential element of temporal reality. But the intellectual climate of that time was not very favorable to the ideas of this kind. The principle of causality appeared as a simple consequence of the law of conservation of energy (Spencer's law of persistence of force), which in its turn expressed in a new and much more precise way the ancient principle

of the indestructibility of substance. This law was considered a sacred dogma, not only by virtue of the empirical evidence in its favor, but also because it was looked upon as a prolongation, and even as a culmination, of the tendencies which had dominated philosophic thought since its beginnings. It is only quite recently that, under the pressure of the new physical discoveries, we have begun to treat the concept of objective contingency with more tolerance. Nevertheless, in Boutroux's time, and even in Bergson's, necessitarian dogmatism, to use Peirce's expression, continuously strengthened by the triumphs of scientific prediction and by the constantly repeated successes of mathematical deduction in the physical sciences, so fascinated minds that almost no one paid any attention to Bergson when he showed that absolute necessity and real succession cannot be reconciled. In his *Creative Evolution,* in a passage which has become classical, Bergson pointed out that the equations of mechanics are concerned only with the extremities of temporal intervals while the intervals themselves are ignored. Even when we talk about them, we scarcely attach any importance to them:

> Common sense, which is occupied with detached objects, and also science, which considers isolated systems, are concerned only with the ends of the intervals and not with the intervals themselves. Therefore the flow of time might assume an infinite rapidity, the entire past, present, and future of material objects or of isolated systems might be spread out all at once in space without there being anything to change either in the formulae of the scientist or even in the language of common sense. The number t would always stand for the same thing; it would still count the same number of correspondences between the states of the objects or systems and the points of the line, ready drawn, which would be then the "course of time."[14]

Several pages farther on, after having quoted the famous passage from Laplace, Bergson adds:

> In such a doctrine, time is still spoken of: one pronounces the word, but one does not think of the thing. For time is here deprived of efficacy, and if it *does* nothing, it *is* nothing.[15]

Bergson was probably not entirely right when he affirmed that a determinist pronounces the word "time" without thinking of real succession. The state of mind of an average determinist is certainly more

14. *Creative Evolution,* authorized trans. Arthur Mitchell (New York: Henry Holt & Co., 1913), p. 9.

15. *Ibid.,* pp. 38–39.

complex, and it was more accurately analyzed by Bergson in his first book, where he showed that belief in the necessary connection of events consists in the association of two irreconcilable ideas: that of logical necessity which requires the preformation and even the pre-existence of the future, which ceases to be future by the very reason of its pre-existence, and the idea of the temporal process of which the phases are authentically successive.[16] These two ideas are combined in such a close association that they are almost inseparable, and their incompatibility, their very distinction, is, as it were, submerged by the deceptive feeling of familiarity which is only an effect of habit, of prolonged automatization. After Bergson, philosophers should have shown more mistrust in respect to such deceptive feelings of familiarity. No progress can be made in the solution of the problem of causality except by carrying the logical as well as the psychological analysis as far as possible, effecting a separation of the incompatible elements which are fused into the deceptive unity of instinctive belief or of automatized association. Progress can be made only by questioning all the tacit implications, based upon a confusion of the logical evidence with the psychological feeling of familiarity. The revision of scientific concepts proceeds by such an analysis, by what M. Bachelard calls "the psychoanalysis of knowledge." This could be illustrated by a practically limitless number of examples in the history of the sciences. Naturally, such an effort to break the almost unbreakable associations by which the classical scientific tradition was constituted can only be difficult and even painful. That is why we must never be surprised by the constantly renewed resistance which rises in the mind when it is confronted with a profound revision of the classical concepts. It was precisely resistance of this kind which prevented even the most serious and honest minds from perceiving the fundamental incompatibility between real succession and timeless necessity. Quite probably, even Laplace, Du Bois-Reymond, certainly Tolstoi and Anatole France, believed sincerely in the reality of time, although time had no justification in their view of the universe. For them, the question asked by James and by Bergson, "Why is the future, which must be present, still not present?" did not even arise.

16. *Time and Free Will, an Essay on the Immediate Data of Consciousness,* authorized trans. [of *Essai sur les données immédiates de la conscience*] R. L. Pogson (New York: Macmillan Co., 1913), pp. 212–18.

However, in some cases—and they were rare—the determinist philosophers were aware of this difficulty. Thus Hans Driesch, after having affirmed, in spite of his vitalism, his quite Laplacian belief in the integral predetermination of the universe, asked himself the following significant question: Why does the activity of the timeless entelechies manifest itself in time instead of expressing itself by a single, complex act? Why does it manifest itself in the laborious development of the organism from its egg to its adult form? He frankly admits, "For that question, we have no answer."[17]

Such a question is certainly strange, but a consistent determinist is obliged to ask it. More frequently, the incompatibility between real succession and deductive necessity was only vaguely felt, but this vague feeling at least found its expression in certain particularities of language, invented to hide the incompatibility. The difference between cause and effect is too real to be entirely ignored. There is nothing surprising in the fact that the feeling of this difference is not entirely absent, even in the most uncompromising determinist mind. However, as the determinist insists on the absolute equivalence of cause and effect, unwittingly he faces a dilemma of which he is only half-aware. According to what we have said, it is obviously necessary to choose one of two assertions: ***either*** real succession with the element of real contingency *or* complete determinism with total absence of succession. Since most frequently the deterministic scientist does not see this dilemma clearly, he tries to retain causal necessity alongside temporal succession, but, as these two ideas are incompatible, he succeeds only in veiling with ingenious verbal formulas the conflict which goes on in the depths of his thinking. What is more, this conflict, as we have already said, suppressed by his conscious thought, manifests itself indirectly by certain particularities of his language. William James showed this in a very clear and precise way in his posthumous book:

> *Nemo dat quod non habet* is the real principle from which the causal philosophy flows; and the proposition *causa aequat effectum* practically sums up the whole of it. . . . But if the maxim holds firm that *quidquid est in effectu debet esseprius aliquo modo in causa,* it follows that the next moment can contain nothing genuinely original, and that the novelty that appears to leak into our lives so unremittingly, must be an illusion, ascribable to the shallowness of the perceptual point of view.

Scholasticism always respected common sense, and in this case escaped the frank

17. Driesch, *loc. cit.*, p. 326.

denial of all genuine novelty by the vague qualification "aliquo modo." This allowed the effect also to differ, *aliquo modo,* from its cause. But conceptual necessities have ruled the situation and have ended, as usual, by driving nature and perception to the wall. A cause and its effect are two numerically discrete concepts, and yet in some inscrutable way the former must "produce" the latter. How can it intelligibly do so, save by already hiding the latter in itself?[18]

And in a footnote on the next page James adds:

The cause becomes a reason, the effect a consequence; and since logical consequence follows only from the same to the same, the older vaguer causation-philosophy develops into the sharp rationalistic dogma that cause and effect are two names for one persistent being, and that if the successive moments of the universe be causally connected, no genuine novelty leaks in.

There is no need to emphasize how that which James calls "the sharp rationalistic dogma" agreed with the energetist conception of reality, in which the cause and its effect were only two energy equivalents, the apparent succession of which masked their underlying identity. Thus, as in the monistic idealisms, ultimate and authentic reality is conceived of as permanent and as always identical with itself, whereas succession belongs only to its phenomenal manifestations. To avoid conflict with our immediate consciousness, which remains irremediably temporal, both physical determinism and idealistic determinism invent ingenious formulas. Instead of denying the reality of time outright, one says that time is only "phenomenal"; instead of saying that the effect is entirely identical with its cause, one says that it is "virtually," or *aliquo modo,* present. Through these verbal concessions, it is possible to avoid the truthless conclusion of Parmenides, which by eliminating succession entirely at the same time eliminates even the superficial difference between cause and effect. Let us say it again: if modern determinism, in its scientific as well as in its idealistic form, hesitates to follow the Eleatic School all the way, it is because the incompatibility of rigorous determinism with the reality of time is at least vaguely sensed.

III. WIDENED CAUSALITY

If we admit that absolute necessity is incompatible with the reality of succession, a single conclusion forces itself upon us. We must abandon the classical concept, that is, the Laplacian or Spinozist concept of causality. Such a conclusion frightens many serious thinkers. They are

18. William James, *Some Problems of Philosophy: A Beginning of an Introduction to Philosophy* (New York: Longmans, Green & Co., 1931), pp. 192–93 and n., p. 194.

frightened because they believe that, with the denial of classical determinism, the intelligible character of the world is forever destroyed. For them the denial of classical causality is equivalent to a "capitulation," even to a "suicide," of reason. Similar apprehensions were expressed when non-Euclidean geometry supplanted the classical geometry of Euclid. Naturally, if one looks upon Euclidean geometry as the only possible geometry, such fears would be justified. In that case, and only in that case, the denial of the fifth postulate of Euclid would result in the ruin of all geometric thought. In an analogous way, if Laplacian causality is the only form of rational coherence which the universe may assume, there would be a reason for fearing that, in eliminating it, we might destroy all possibility of rational explanation. The arguments of Herbert Spencer, John Fiske, Hippolyte Taine, and all the other determinists of the last century against free will were inspired by this facile confusion of the two terms "rational" and "determinist." As William James remarked in 1884 in his essay "The Dilemma of Determinism":

> Nevertheless, many persons talk as if the minutest dose of disconnectedness of one part with another, the smallest modicum of independence, the faintest tremor of ambiguity about the future, for example, would ruin everything, and turn this goodly universe into a sort of insane sand-heap or nulliverse, no universe at all.[19]

Then, two pages farther on, James gives some samples of the argumentation by which the determinists try to reveal the fundamentally irrational and even absurd character of their rivals: "A man's murderer may as probably be his best friend as his worst enemy, a mother be as likely to strangle as to suckle her first-born, and all of us be as ready to jump from fourth-story windows as to go out of front doors, etc."[20] In other words, it is believed that, without strict causality, the world is only the domain of the most capricious chance. More recently we have seen the same mistrust on the part of philosophers in reference to the revision of determinism in contemporary physics. René Berthelot, Léon Brunschvicg, and Hans Driesch, to name only a few,[21] have shown

19. William James, "The Dilemma of Determinism," *The Will To Believe*, pp. 154–55.

20. *Ibid.*, p. 157, n. 1. James adds: "Users of this argument should properly be excluded from debate till they learn what the real question is. . . . Persons really tempted often do murder their best friends, mothers do strangle their first-born, people do jump out of fourth-story windows, etc."

21. H. Driesch, "Naturwissenschaft und Philosophie," *Actes du Congrès International de Philosophie, à Prague* (1934); R. Berthelot, *Bulletin de la Société Française de Philosophie*, Vol. XXXIV, No. 5 (October–December, 1934); L. Brunschvicg, *La Physique du vingtième siècle et la philosophie* (Paris, 1936).

their skepticism concerning the objectivist interpretation of uncertainty relationships. As Jean Louis Destouches has asserted,[22] this resistance was inspired by philosophical motives which are not essentially different from those which were found in Spencer, Taine, and Fiske. It is feared that the rational universe may crumble into a shapeless mass of disjoined and capricious facts.

Let us say immediately that such fears are hardly justified because they are based on the gratuitous supposition that the indetermination now being envisaged is a *complete* and, so to speak, *absolute indetermination*. Now this is not at all the case. Absolute indeterminism is a very rare phenomenon, even with philosophers. It can be found in Epicurus and in Lucretius and, in the modern era, in Renouvier, at least in a certain phase of his philosophy when he was defending the notion of "absolute beginning." But, if we read carefully the works of those who defend the indetermination of the universe in the name of the reality of time, we see that their indeterminism is far from being absolute. The temporalistic philosophers, or, as they are called in English-speaking countries, the "process-philosophers," insist vigorously on the continuity of the past with the present, on the cohesion of the successive phases of becoming. Reread the passages of William James on the stream of consciousness or on the continuity of the perceptual flux; reread Bergson, especially that passage, so infrequently quoted, in *Matter and Memory,* where he affirms that creation is never *creatio ex nihilo* because each present moment is colored by its past; reread Whitehead when he speaks of "causal efficacy" in nature.[23] What, then, is the difference which separates them from the classical determinists? There is only one: when they speak of connection, of continuity, of cohesion of cause and of effect, they affirm that this connection, this continuity, this cohesion, is *temporal* in the true sense of the word, and as such it cannot be the equivalent of static connection, of logical implication; consequently, that it must contain an element of *irreducible novelty,* an *authentic differentiation between cause and effect,* a differentiation which has in it nothing irrational and nothing miraculous because it expresses the distance between the present and

22. Jean-Louis Destouches, *La Physique moderne et la philosophie* (Paris, 1939), pp. 39–40.

23. A. N. Whitehead, *Process and Reality* (Cambridge: Cambridge University Press, 1929), *passim*.

the anterior moment. Briefly, if we venture to use a formula which is perhaps too condensed, we can say that for a modern contingentist time *truly flows* and that the partial indetermination of each temporal moment is only a manifestation of this real flow, whereas, for the classical deterministes, time flows, according to Bergson's expression, only because reality demands this sacrifice, "taking advantage of an inadvertence in their logic."[24] We can also say that, for modern contingentism, the *future remains* future, that is, virtual by its own nature, whereas for Spinoza, Laplace, and the others, the future is only a *hidden present.*

In recognizing the virtual character of the future, modern contingentism admits the category of *possibility* which, according to classical determinism, possesses no objective character, being only a manifestation of our ignorance. For Spinoza, for Hegel, and for Laplace, the *real* and the *necessary* are two *synonymous expressions*—for that which is not real is impossible. Consequently, there is no middle ground between the necessary and the impossible. That is why the future, being necessary, must be, for a consistent determinist, *as actual as the present* and as completed as the past. The unlikely and even absurd character of such a consequence has already been fully exposed by Émile Boutroux:

> Is it to be admitted that all possibles are, in their essence, eternally actual; that the present is made up of the past and is big with the future; that the future, instead of being contingent, already exists in the mind of the one supreme purpose or understanding; and that the distinction between being and the possible is but an illusion caused by the interposition of time between our point of view and things in themselves?
>
> This doctrine is not only unwarranted and impossible of proof, it is also unintelligible. To say that each thing is actually all it is capable of being is to say that it unites and reconciles, within itself, contraries, which, from the knowledge we have of them, can exist only by replacing one another. But how can we conceive of these essences as formed of elements that are mutually exclusive?[25]

The logical force of this passage was recognized, at least implicitly, even by Alfred Fouillée, who has always remained a staunch adversary of contingentism. It was probably under the influence of the passage we have just quoted that Fouillée wrote in his critique of contingentism:

24. H. Bergson, *The Creative Mind,* trans. [of *La Pensée et le mouvant*] Mabelle Andison (New York: Philosophical Library, 1946), p. 220.

25. É. Boutroux, *The Contingency of the Laws of Nature,* trans. F. Rothwell (Chicago: Open Court Publishing Co., 1920), pp. 21–22.

> We live in time and we reason in time. Now in time it is *contradictory* to say that the future exists and acts, since, in that case, I am at once living and dead, really living and really dead, my future death being already real, as is my present life. Such a theory means the elimination of all possible thought and of all possible experience, since thought cannot admit the simultaneous actuality of contradictories, and since experience cannot grasp the present and the future simultaneously.[26]

It is obvious that here Fouillée sought to answer the question which the contingentists always ask: "If the future is certain in all details, why is it not already present?" To this question Fouillée answers: "It is the incompatibility of the successive events which prevents the future from being contemporaneous with the present." Succession is thus only a consequence of the law of contradiction. Moreover, the same idea had already been expressed by Leibniz when he defined time as "the order of inconsistent possibilities."[27] But neither Leibniz nor Fouillée was aware that, by such a concession, they were indeed undermining the ground on which their determinism had been built. For the fundamental incompatibility of the successive phases, which they admitted, is precisely *completely contrary to the connection of logical necessity* which, *according to them, joins the successive events.* One of two propositions must hold here: *either* the successive phases of each temporal process are mutually deducible, *or* they are logically incompatible. But it is clear that they cannot be at the same time mutually derivable and incompatible. This impossibility is only another aspect of the fundamental incompatibility of strict determination and real succession.

The fear that the elimination of rigorous causality may destroy all intelligibility of the universe is, let us say again, childish. On the contrary, it is contingentism which makes causality—or rather let us say *causation* (reserving the term "causality" for Laplacian causality)—more intelligible. We have seen that rigorous determinism virtually destroys the temporal character of reality as well as all the difference between cause and effect. But have we not then the right to wonder, along with Boutroux: *"Would this also be a consequent, an effect, a change, if it differed from its antecedent neither in quantity nor in quality?"*[28] By re-establishing the temporal character of causation, we escape the bizarre paradoxes of necessitarian determinism of which the deter-

26. Alfred Fouillée, *La Pensée et les nouvelles écoes anti-intellectualistes* (Paris: Alcan, 1911), p. 140.

27. G. W. Leibniz, *Phil. Schriften*, I, 568.

28. Boutroux, *op. cit.*, p. 29.

minists themselves were often unaware. But in thus restoring the real difference between cause and effect, we are conceding the reality of contingency, or at least of the element of contingency; for the difference between the successive phases of becoming is only another name for the element of contingency, of unpredictability, of radical novelty, which is the very essence of temporal causation.

Let us stress the fact that it is this notion of widened causation which contemporary physicists—or at least most contemporary physicists—are tending to adopt under the impact of recent discoveries. The concept of objective possibility, which was always looked upon as legitimate by the contingentists, comes into the field of science in the form of the concept of *objective probability*. For the classical physicists the concept of probability was only a useful conceptual tool which could be used when the physical events were too complex to be analyzed in detail. However, nothing objective corresponded to this conceptual fiction despite its practical utility. Such an attitude was entirely logical. If there are no real possibilities, there are no real probabilities, either; for, as the German physicist, Weizsäcker, quite recently observed, the concept of probability is only the quantitative form of the concept of possibility. The contingentists were always opposed to this subjectivist interpretation. Let us remember Cournot, let us remember Renouvier, when he insisted in his *Essai de logique générale* that "the equal possibles of Laplace are to be understood in the final analysis as truly indetermined possibles in themselves, as possibles which are rigorously ambiguous." Let us remember James, when he had the courage to maintain as early as 1884 that *"somewhere,* indeterminism says, such possibilities exist, and form a part of truth."[29] Bergson's attitude seemed more ambiguous because he resolutely denied the pre-existence of the future in any form, even in the form of possibility. That is at least the thesis defended in the first two essays of his book, *The Creative Mind* [*La Pensée et le mouvant*]; but, on the other hand, we have to reread pages 204–12 of *Time and Free Will,* in which Bergson, while rejecting the mathematical preformation of the future in the present, still affirms that there is a preformation of another sort, which constitutes our consciousness of time—this is the preformation of the future "in the form of pure possible." Thus we see that the category of the possible has its place in Bergson's thought, which is not surprising, for the

29. O. Hamelin, *Le Système de Renouvier* (Paris: J. Vrin, 1927), p. 147; William James, "The Dilemma of Determinism," *The Will To Believe,* p. 151.

complete elimination of this category is found only in the defenders of integral necessity. Space does not permit us to discuss here the precise meaning of the Bergsonian views on possibility, which, in appearance, were seemingly contradictory. The reader should consult the final chapter of M. Jankélévitch's book on Bergson. On this point, the French and American contingentists anticipated the tendencies of contemporary physics or at least the objective interpretations of uncertainty relationships. Although Reichenbach recently proposed to replace strict causality by probable implication, he was scarcely aware that such a probabilistic interpretation of uncertainty relationships agreed with the conclusions of Cournot, Renouvier, Boutroux, James, Bergson, Peirce, and, more recently, Whitehead. At the same time we see why contingentism can be called a *relative determinism:* the future *is* determined, but only in its general character, never in its actual details. It is this general orientation of each present moment that contemporary physics grasps in the form of probabilistic laws.

In the light of quantum physics we can today answer the objection which Ralph Barton Perry raised against the Bergsonian affirmation of the incompatibility between rigorous necessity and the reality of time. It will be remembered that, according to Professor Perry, the simple fact of mechanical motion establishes irrefutably the compatibility of time with rigorous necessity: a material particle, whose trajectory is entirely determined by the laws of mechanics, nevertheless *moves,* that is, it occupies diverse positions in space *in successive moments.* But this example is obviously borrowed from macroscopic (i.e., from classical) physics. Its plausibility and its apparent clarity are completely deceptive in the light of recent physics. The predictability of the positions of any given macrophysical particle—and we observe only macrophysical particles—is only *approximate* and, as such, remains entirely compatible with the fundamental contingency of underlying microphysical events. The predicted trajectory of a particle, which, in our macrophysical perspective, appears as a precise geometric curve with no transverse thickness, is, in reality, a *thin tube,* a *bundle of possible routes,* which, although very thin, still has transversed dimensions corresponding to the quantic indeterminations of the future positions.[30]

30. See my articles: "The Doctrine of Necessity Re-examined," *Review of Metaphysics,* V, No. 5 (1951), 40–45; "Relativity and the Status of Space," *ibid.,* Vol. IX, No. 2 (1955); and "La Théorie bergsonienne de la matière et la physique moderne," *Revue Philosophique,* Vol. LXXVII (1953).

Thus even in the example considered by Professor Perry, the so-called route of the future is far from being "the only possible route," because it is composed in reality *of the entire field of the possibilities,* which, although very close to each other, still remain distinct. In other words, it is only by virtue of our macroscopic myopia that the field of the diverse possibilities seems to shrink so that it appears finally as a precise infinitely thin line of "the only possible route." There is no need to emphasize that such expressions as "the only possible future route" and "the necessary route of the future" are completely equivalent; classical determinism, by eliminating all the future possibilities save one, in fact eliminated the category of possibility, which was thus reduced to a human and temporary ignorance. In the light of recent physics such an elimination of the concept of possibility is no longer legitimate, although we understand how the character of the macroscopic world, as well as the limitations of our perception, made it inevitable before the time of quantum physics. Nor is there any need to emphasize that the concept of a solid and permanent particle is no longer adequate on the microphysical scale, since solidity itself is only an illusion—a necessary illusion, it is true—of our gross perception. The microscopic reality seems to be composed of *events* rather than of *things.* We may wonder to what extent the Eleatic and atomistic habits of our thinking have been determined by this "logic of solids," which, according to Bergson and Bachelard, is a subconscious foundation of the classical intelligence and which is virtually outlined in the very structure of our macroscopic perception. This is the question which the modern followers of Parmenides and Democritus do not ask themselves.

Not only quantum physics but also relativistic physics confirm the temporal, therefore contingentist, conception of reality. Such an affirmation may appear surprising because it is opposed to the rather widespread presumption according to which the fusion of time with space in the theory of relativity operates in favor of space and that the space-time of Minkowski is a static entity in which the alleged successive phases of cosmic history coexist in their eternal juxtaposition. We do not have space here for a detailed critical analysis of this singular misunderstanding, to which Minkowski himself contributed. Let us merely remember the numerous criticisms made of this erroneous interpretation, from Langevin to Eddington and to Meyerson. Quite justifiably, we can affirm that the fusion of space with time operates, contrary to the easy popular notions, in favor of time and that, instead of the

spatialization of time we have rather a temporalization, or at least a dynamization, of space.[31] Let us simply recall the fundamental principle of relativistic dynamics according to which there is an upper limit to the transmission of any causal action: this is the speed of the electromagnetic waves. This is, as Paul Langevin said, the speed limit of causality. Thus there are no instantaneous transmissions in nature; there are only successive connections. In other terms, the theory of relativity has boldly stressed the idea that *the effect is never contemporaneous with its cause* and that causation is always irremediably, and by its very nature, successive. We have already seen that the reality of contingency inevitably follows from the successive character of causation. One may raise an objection by pointing out that contingency is not at all introduced into the theory of relativity. But that is due to the *macrophysical* character of the theory—the microphysical indetermination is, so to speak, masked by the laws of the big numbers on the macrophysical scale, and that is why it has been discovered only on the microphysical scale. But we must not be deceived here: the dynamic and unfinished character of physical reality is as present on the macrophysical scale as it is in the microcosm.

If real novelties exist even in the physical world, there is nothing surprising about finding them in the area of life and of consciousness. Moreover, almost all the objections which have been raised against indetermination on the biological and psychological scale have been inspired by dogmatic belief in physical determinism. It is obvious that the widening of the notion of causality creates a novel situation for the problem of freedom. All the contingentists were aware of it, although they have confused microphysical indetermination with the freedom of living beings. But the discussion of the very complex problem of relationships between contingency and freedom would lie outside the scope of this article.

31. Louis de Broglie, "L'Espace et le temps dans la physique quantique," *Revue de métaphysique et de morale*, LIV (1949), 119–20.

NOTES AND DISCUSSION

Alfred Métraux

THE ANCIENT CIVILIZATIONS OF THE AMAZON: THE PRESENT STATUS OF THE QUESTION OF THEIR ORIGINS

Scarcely fifty years ago the "Indian sphinx" posed enigmas that seemed simple. Known pre-Columbian civilizations were relatively few, and their past, however obscure, could be considered recent in contrast to the millenniums that separate us from the cultures of the ancient Orient. Today this is no longer true. The emergence of new archeological horizons has singularly transformed our summary view of the history of man in the Western Hemisphere. The date of the first human migrations through the Bering Straits has been put back some twenty or thirty thousand years—to the Aztec, Mayan, and Incan civilizations which the Spaniards knew in their full flower. Others have been added which, in turn, give rise to fresh enigmas.

Translated by Elaine P. Halperin.

THE CIVILIZATION OF MARAJÓ

Disdaining the rest of South America, archeologists have obviously concentrated their attention and efforts on the Andean civilizations. For a long time it was the tradition, even in scientific works, to compare the Andes, cradle of kingdoms and empires, to the plains and forests of the Amazon, that vast, natural preserve of savage and wretched tribes. However, in the case of both Brazil and Venezuela, enough ancient relics had already been collected and reproduced in the nineteenth century to warrant a subtler way of expressing the contrast between "civilization and savagery." The many burial urns dug up from mounds (artificial hillocks) on the island of Marajó were the first to bear witness to the high level of civilization which certain peoples of the tropical forest had achieved. The technical and aesthetic quality of these relics testify to the presence, at the mouth of the Amazon, of a very ancient people who, in many respects, were different from the modern, indigenous inhabitants of Brazil. The singular geometric designs that ornament the pottery which originated in Marajó Island aroused the curiosity and, unfortunately, the imagination of archeologists. Egyptians, Assyrians, and Chinese were evoked apropos of these lucky finds, to say nothing of the Vikings, to whom was attributed the introduction into the Americas of a "civilization of mounds"—and this long before Thor Heyerdahl had appropriated such romantic reveries. One scholar even perceived in the ornamentation of these ceramics evidence of hieroglyphic writing.

Nothing seemed to indicate that the island of Marajó would become the center of the sturdy and inventive civilization we know it to be. Situated almost below the Equator, with a surface area of 14,000 square miles, it is the largest of the islands that have been formed by the alluvial deposits of the Amazon. It owes its configuration to a slight, rocky basset along the eastern coast. A part of its periphery and its surface, the land and the waters, are as yet inadequately separated. As a result the muddy plains which during the rainy season are transformed into lakes and swamps become, during the dry season, fields whose soil is hardened and crackled by the sun. These stretches of land, alternately moist and dusty, are sprinkled with clumps of palm trees that reveal the presence of an *ilha* (island), an area that rises above the level of the waters. It is here that the archeologist is most likely to find pre-Columbian relics. Marajó, which today is a cattle-raising region, is

not a likely place for farming. For this reason it is difficult to understand why it had become the habitat of a sedentary people who had achieved a certain subtlety in the arts, since the natural resources of the area were more conducive to the life of nomads subsisting on hunting, fishing, and fruit-picking.

It is unfortunate that the Indians of Marajó Island were killed off before anyone had taken the trouble to describe them. No missionary has handed down information about them comparable to the kind of knowledge we possess about other regions of Brazil. The proximity of Belém do Pará, capital of the Portuguese Amazon, was one of the major factors that contributed to the extinction of the inhabitants of Marajó. As early as the seventeenth century they became the prey of slave-hunters. This, together with epidemics, explains why they had completely disappeared by the beginning of the nineteenth century.

The scant information available in official documents contains no allusion to a way of life or to industries that might have been appropriate to the unknown people who made the island famous. Therefore it is hardly likely that the Indians—the Arucas or others—who were in contact with the Portuguese could have been the continuators, albeit decadent ones, of the Marajó civilization. Moreover, no tomb belonging to this cultural phase has as yet yielded any object of European origin, in contrast to neighboring civilizations that survived, until the middle of the colonial period, in the south of Guiana and in the islands north of the Amazon. It seems evident that the Marajó civilization had already expired when Orellana sailed down the Amazon in 1541.

All that we know of the way of life, the social structure, and the beliefs of the people who have bequeathed to us such brilliant testimony of their existence is confined to the data of archeology. That they possessed an advanced political and social organization can be inferred from the very size of the collective undertaking that was able to erect mounds 26 feet high, 400 feet long, and 13 feet wide. The necessity of sheltering villages and cemeteries from the rivers would not have sufficed to mobilize the large number of groups that moved all this soil with the most rudimentary of tools. Leaders were needed to co-ordinate and direct the work. The luxurious character of some of the tombs testifies to the existence of rich and powerful men. The funeral rites combined an unpretentious burial—that is to say, inhumation of the dead man's bones in an urn—with cremation. Clay figures of women were identified, perhaps erroneously, as idols. The presence of clay

spindles as well as of certain decorative motifs of pottery attests to a knowledge of weaving. As for clothing, the only relics that have survived are the famous terra-cotta loincloths, or *tanga,* to which we will refer later. Because the island of Marajó was almost entirely devoid of rocks, stone objects were extremely rare. Consequently, ceramics are virtually the only things that remain of this enigmatic people. They suffice to justify their fame.

Marajó pottery is characterized by the simultaneous use of several decorative techniques: modeling, painting, and carving. If, for example, one examines the large burial urns—the finest examples of this type of ceramics—one notes, first of all, strongly stylized human faces in bas-relief, modeled embellishments depicting animated beings—men or animals—the only readily identifiable image being that of the cayman. The empty spaces are decorated with geometric patterns which include volutes, saw-cuts, zigzags, "hands with widespread fingers," "crosses with escutcheons," etc. To create these adornments, the artist often drew deep lines in clay that was still soft so that, once painted, the whole suggested cloisonné enamel. Occasionally, the designs were carved in the engobe with a stiletto so that they emerged red on a white background or vice versa. Black or brown stripes emphasized the contour of the engraved designs. Extreme stylization of the human face resulted in a T-shaped motif which the artist used most effectively. Similarly, stripes that at first glance seemed to be sprinkled with dots and symmetrical lines proved upon examination to be so many human faces reduced to eyes separated by vertical lines. On certain burial urns the painting and modeling together evoke the summary image of a human being. The lozenge-shaped eyes are often traversed by an oblique line that makes the face look sad. Perhaps in this way the artist wished to suggest mourning or grief, although it is always hazardous to attribute our own symbolisms to a civilization that has disappeared.

Like the Sumerians and the Babylonians, the inhabitants of the Amazonian delta fashioned out of clay objects which are usually made of other materials. Thus terra-cotta chairs were found which remind us of those that modern Indians carve from blocks of wood. Cylinders also made of clay seem to have been used as labial or auricular adornments; but the strangest items among the Marajó ceramics are the triangular plaques, slightly convex and perforated at each end. The shape of these objects and certain worn places in them, as well as their association with female skeletons, gave them the name of *tanga,* or loincloth.

They have been compared to the triangular pieces of bark that the Indian women of Haut-Xingú still wear. A recently discovered tiny statue which has been regarded as suggesting one of these articles of "clothing" would seem to confirm the archeologists' hypothesis as to the purpose of these objects. However, in the collections, there are such large and heavy *tangas* that they can scarcely be identified as loincloths. In the absence of any better explanation, they have been catalogued as "ritual objects used in ceremonies of fecundity."

No less enigmatic is the significance of small statues portraying a woman crouching, her hands on her hips. These figurines, akin to those discovered in such great quantities in Venezuela and in Central America, testify to cultural contacts and to an interchange of influence between peoples throughout the Antilles Ocean who have disappeared today. We do not know and doubtless never will know why these objects enjoyed such a vogue. Did they have a religious function? This has been asserted, but no proof has been given.

THE CIVILIZATION OF SANTARÉM

The honor of having discovered the second of the great Amazonian civilizations belongs to the famous German-Brazilian ethnographer Curt Nimuendajù. During one of his trips to the Amazon a German missionary told him that the children of Santarém, a city at the mouth of the Tapajoz, were playing with little clay figures and animals called *caretas* ("masks") which they had picked up from the streets after the rains. Intrigued by this tale, Nimuendajù went to Santarém in 1922; there he discovered the former site of a large Indian village. During the ensuing years he explored other archeological sites of the region. His researches were greatly facilitated by the blackish color of the soil in places that had once been inhabited. Often, too, hillocks marked the location of ancient huts, and the outline of roads that had connected the villages was still visible in spite of very tall trees obstructing the path. Nimuendajù was able to pick out more than sixty-five archeological terrains, but neither he nor his successors ever discovered any tombs; this explains why so few complete and intact urns have been exhumed in contrast to the thousands of fragments and broken pieces that were strewn over the ground, sometime forming layers 5 feet thick. In the city of Santarém, which now occupies the site of an Indian village, whenever there are heavy rains, the torrents of water that run

through the streets carry innumerable fragments of pottery into the river.

The style of the Santarém pottery is very different from that of Marajó. It shows a definite tendency toward designs in bas or high relief, toward intricate and capricious forms. It has often been termed "Baroque," and Nils Erland Nordenskjöld even wondered whether it had been inspired by the art of the Jesuits. We might add that even he rejected a hypothesis that was entirely unwarranted from a historical point of view and which an analysis of the decorative motifs completely invalidated. On the other hand, the caryatids and the figures in relief which embellished the great urns of state offer striking analogies with the adornments of the pre-Hispanic ceramics of the Guianas, Trinidad, and the Greater and Lesser Antilles. The ceramics of Santarém are less readily definable than those of Marajó precisely because of the capricious and abundant inventiveness that characterizes them. We will confine ourselves to describing a few of the pieces that are most typical of this kind of pottery.

The so-called "bell-shaped base" urns are of a globular or oval shape, held together on each side by two heads of birds with pronouncedly crooked beaks. The piece of pottery, set on a conical base, is crowned by a multibordered neck and by figures and animals carved in relief. As for the "caryatid vessels," these are bowls adorned with ornithomorphic inlays and appendices resting on a ring worn by three tiny figures crouching along the rims of a base shaped as an hourglass. The ornamentation in high relief is accompanied by motifs that are engraved in the clay. These motifs are geometric in character, although occasionally stylization of people or animals can be recognized. The Brazilian archeologist Frederico Barata collected a series of designs in the same motif and attempted to reconstitute a stylistic evolution going from realism to pure abstraction. Thus, for example, pictures of coiled serpents gradually became mere volutes. However, this evolutive theory about the origin of ornamentation, which goes back to Stölpe, has ceased to be looked upon favorably ever since it appeared that, in many instances, the very reverse took place: a purely geometrical theme often suggested the form of an animal and thus was transformed into a representational design.

When contrasted with Marajó pottery, the Santarém style seems realistic. Whereas the animals designed in high relief that adorn the urns of the Marajó civilization are so unrecognizable that they are

termed "vitamorphous" embellishments, the animals that the Santarém potters used as models are readily identified; for instance, the jaguar with open mouth and spotted body; the agouti, seated on his rump and nibbling fruit; the toucan; and the vulture. Interested as the ceramicists were in the local fauna, they nonetheless devoted a large share of their attention to man. The small people standing on the bodies or on the rims of urns wear diadems and plumes in their hair and heavy adornments on their ears.

The realism that is manifest in the modeling of ornamental figurines is even more marked in certain anthropomorphous urns; they are almost "portrait urns." Although they did not achieve the mastery of the Peruvian potters, the Santarém artists attempted to reproduce familiar gestures of the people they fashioned. For example, one of them has turned his head and is resting it on his right hand, while his left arm hangs down along his thigh; a crouching woman is sucking her foot.

OTHER CENTERS OF CIVILIZATION IN THE AMAZON

There is every reason to hope that other archeological centers, perhaps as important as that of Santarém, which was still unknown to us only a quarter of a century ago, will be uncovered by future scientific explorations. We are already familiar with a whole series of sites that have provided us with pieces of pottery in which we perceive affinities either with Marajó or with Santarém art. However, these lucky finds correspond to local cultures whose age, diffusion, and characteristics must be more precisely defined. The limited scope of this article makes it impossible to give a detailed description of these archeological sites, yet a few of these regional civilizations are deserving of brief mention.

The coast of Brazilian Guiana and the islands situated to the north of Marajó Island were formerly occupied by unidentified peoples who have left many traces of their presence behind them. At Counany, in vaulted, subterranean chambers, funeral urns and pottery were found that combine elements of high relief with painted motifs. In the same region, at Maracay, funeral urns were discovered that have a curious form. They portray people seated on a little bench, their hands on their knees. The cylindrical body, the tubular limbs, and the rounded or conical head, in the shape of a lid cover, suggest people who might have been made of stovepipes. Glass beads of European origin found inside the urns leave little doubt as to the period when they were fashioned—

probably the seventeenth or eighteenth century. Furthermore, some vessels of a still later date portray bearded individuals.

The region of Mojó in Bolivia, although situated at the periphery of the Amazon and thousands of miles from Marajó, had also been the habitat of a people who were potters; they erected hillocks upon which they built their houses and under which they buried their dead. Today these abandoned mounds are covered with debris.

Nordenskjöld's excavations in some of these sites, though they have been quite fruitful, give us but scant notion of the archeological wealth hidden there. It is quite probable that these relics were the work of the Mojó Indians, whom the Jesuits evangelized and whose descendants still live in the same region. Originating in the Amazon, the ancestors of these Indians brought to the foot of the Andes a civilization adapted to the conditions of forest life, yet one in which we discern, as we did in regard to Santarém, the remote influence of the civilizations of Central America. In this new habitat the Mojó Indians borrowed variously from other peoples of the Andes perhaps as long ago as the period of the Empire and of the Tiahuanaco civilization, which preceded the Inca kingdom by five centuries.

THE ORIGINS OF THE INDIAN CIVILIZATIONS IN THE AMAZON

What are the origins of Amazonian civilization? Can they be attributed to historically known people? In which epoch did they flourish? How widely dispersed were they, and what influence did they exert on South America?

Historical resources are of but little avail in attempting to resolve these problems. In admiring Marajó and Santarém pottery in a museum, we can hardly repress a feeling of irritation against the first explorers of the Amazon who proved to be so lacking in curiosity about the customs and crafts of Indians with whom they frequently had friendly relationships. However, they did observe a few striking details which, when contrasted with archeological discoveries, acquire a fresh significance. Let us take, for example, the famous tale of Father Carvajal, who accompanied Orellana when he sailed down the Amazon in 1542.

Referring to the pottery of the Omagua Indians, Carvajal assures us that it was "the most beautiful in the world, superior to the pottery of Malaga, that it was glazed and enameled in all colors and so altogether dazzling that it filled one with amazement, and that it was very skil-

fully designed and painted because these natives naturally fashion and paint everything in the Roman manner."

These encomiums are scarcely applicable to Santarém ceramics, or even to those of Marajó, for they were neither glazed nor enameled; but they can be bestowed upon the pottery of the Upper Amazonian Indian who fashions urns of great quality even today. These are painted in black and red on a cream-colored background and coated with a vegetable glaze that makes them most attractive. One century later, Father Cristóbal de Acuña, one of the first white men to go up the Amazon as far as Cordillera, referred to the wood sculptures of the Caripuna and Zurino Indians. But all these descriptions have to do with the tribes of the Middle and Upper Amazon; they are not concerned with those of the Lower Amazon, whose civilization was far more advanced. We remarked before that no ancient text mentions the ceramics of the Marajó.

On the other hand, ancient chronicles, although they are mute as regard Santarém pottery, provide us with very useful information about the culture of the Tapajo Indians, who disappeared during the eighteenth century and whose level of civilization was sufficiently advanced to warrant our attributing to them the ceramics discovered on their territory. During the seventeenth century the Portuguese still feared the poisoned arrows of the Tapajos; the latter worshiped painted idols and adored the mummified bodies of their ancestors. Just like certain modern Amazonian tribes, the ancient Tapajos allowed the cadavers of their relatives to rot, then they pulverized the bones in order to drink them diluted with corn beer. In fact, despite many attempts, as yet not a single cemetery containing objects that belonged to this tribe has been found.

The most precious objects of the Amazon are the famous *muyrakita,* amulets in jadeite, usually shaped like a batrachian. Father Heriarte assumed that the Santarém Indians used these objects for commercial purposes. He stated: "It is commonly said that these stones are fashioned in the Tapajos River with a green clay that is molded in the water. The Indians make them under water in the shape of long, round pearls, drinking cups, birds, grasshoppers and other images. When objects thus modeled are taken out of the water, contact with the air transforms them into very hard, green stones." Naturally, these details are the purest fantasy, but nonetheless they reveal the place where these pend-

ants and amulets in jadeite and amazonite were molded.

A powerful political organization, the worship of ancestors, commerce in ceramics and stonework—all these are signs of a level of civilization that tallies with the artistic quality of the Santarém findings.

Therefore we are almost certain that the civilization of Santarém still flourished at the beginning of the seventeenth century and that it was destroyed by the Portuguese. The excavations undertaken in the black soil of Santarém brought us no stratigraphic information, and none of the modern methods of archeology was applied in the exploration of these sites. Lacking even a relative chronology, it is impossible to reconstruct the origins or the evolution of the Santarém civilization. The situation is quite different in regard to Marajó, where the admirable work of Mrs. Betty Meggers and of Clifford Evans[1] has shed light on the ancient history of the primitive cultures which succeeded one another. Today we know that the so-called "Marajó" civilization emerged at a relatively late date and had been preceded by three "cultural phases" of a very different nature. The first inhabitants of the island were a hunting and fishing people who left few traces of their presence. They were followed—perhaps during the twelfth century A.D.—by a people whose cultural level was close to that of the modern Amazonian tribes. They introduced into the island a civilization that was termed "Anatuba," the name of the principal site whence its relics were exhumed. The "Anatuba phase" is characterized by rather ordinary pottery, adorned solely with engraved lines. The depth of the archeological layers leads one to conclude that the same site was occupied for several centuries; but the absence of any European object justifies the assumption that the Anatuba phase occurred prior to the discovery of Brazil. The so-called "Mangueiras" stage followed, and it, too, corresponds in time with the invasion of tribes whose way of life was adapted to the tropical forest. This second wave of emigrants spread over a large part of the island and even to Guiana. During the course of the ages they were subjected to the culture of Anatuba. Since no cemetery belonging to this people has been discovered, we are inadequately informed about their funeral rites. However, we do know that their urns have engraved lines and that they made clay pipes and labrets. They, too, disappeared before the arrival of the white man.

1. *Archeological Investigations at the Mouth of the Amazon* (Bureau of American Ethnology Bull. 167 [Washington, D.C., 1957]).

Finally, a third people, those of the "Formiga phase," appeared on the Marajó scene before the advent of the true Marajó civilization. This new group was not fundamentally different from the preceding ones; its pottery was also of inferior quality, even though it already built its homes upon mounds and burned its dead.

The archeological phase that corresponds to the Marajó civilization is therefore the fourth on the island. It goes back to the thirteenth or fourteenth century, the date when it achieved its full development. There is no apparent connection between it and the preceding and far more primitive cultures. Far from having developed on the spot, the various archeological sites present us, on the contrary, with an illustration of its slow decadence. During the course of the ages the pottery became less varied and elaborate, and the embellishments were drawn or modeled with less care, which indicates that the art of ceramics had ceased to be a specialized industry. Social disorganization is reflected in the uniformity of the style of sepultures. Thanks to similar indications, we can follow the decline of the Marajó civilization until the time when it culminates by merging with the cultures of the "tropical sylva."

Archeology, then, teaches us that the "Marajós" came late and that they imported an already mature civilization which rapidly grew decadent. Can it reveal to us the place where this culture was shaped and from where it emigrated? At first the style of Marajó was likened to that of Chavin in Peru, but, in spite of some vague resemblances, the chronological discrepancy makes it impossible to attach great importance to such analogies. The civilization of Chavin, one of the most ancient in Peru, was in full flower several centuries before the Christian Era, while that of Marajó developed perhaps fifteen hundred years later.

Given the current state of our knowledge, it would seem that the cradle of Marajó civilization must be located on the eastern slopes of the Andean Cordillera, at the Equator, or in Colombia. For a long time archeologists explained the formation of the primitive cultures of Venezuela by migrations that arrived by foot from the Andes or else used the waters of the Amazon or the Rio Negro. The Amazon has been explored so inadequately from an archeological point of view that the itineraries attributed to these migrations are inevitably subject to revision. This is all the more true because the entire region where the northern tributaries of the Amazon take their source is still terra incognita to archeology. We hope therefore that some day chance will present us with relics of the cultures from which the Marajó civilization

was derived. While awaiting this lucky day, relationships between Marajó and the ancient Andean civilizations cannot be established save on the basis of comparison between certain stylistic details and types of pottery. When we look at a map and point to the regions in South America where similarities between primitive cultures and the Marajó civilization are most abundant, we realize that these areas seem to be clustered around northern Peru, the Equator, Colombia, and Venezuela —in other words, in the northwest section of the continent. Among the common features which have attracted the attention of archeologists, we can cite as examples the terra-cotta benches, the urns with an annular base, those with hollowed rims, the technique of cloisonné enamel, and pottery adorned with wing-shaped designs.

Lacking a sufficient fund of archeological material, is it possible to find techniques and forms of art among contemporary Indians that are somewhat similar to those of Marajó? As we have already pointed out, the tribes of the Upper Amazon continue to fashion ceramics of a high aesthetic quality. For some time archeologists have called our attention to the resemblance between the painted or carved Marajó urns and these modern receptacles painted in black and red. From this they have concluded that the Ucayali, Huallaga, and Napo tribes had preserved, as survivals, certain aspects of the ancient Amazonian art. This hypothesis, although it is an engaging one, does not explain the disappearance of other decorative motifs, particularly techniques as typical as cloisonné enamel or carving. Meggers and Evans are inclined to believe that both the ceramics of Marajó and those of the Upper Amazon derive from some common source which has not, as yet, been identified. In support of this theory they remind us that on the Rio Napo, one of the Amazon tributaries whose source is in Colombia, funeral urns and pottery were discovered which, in many respects, are akin to those of Marajó. Some of these urns bear such a striking resemblance that it was believed they were procured through trade at the mouth of the Amazon.

The area where certain cultural elements characteristic of Marajó have spread is not limited to Colombia or the Equator. Many of these elements are to be found in the tropical plains of Bolivia or in the valleys of the eastern slope of the Peruvian Andes. This should not surprise us. We have known for some time that the influence of the civilizations of northwest America has made itself felt among peoples living all along the chain of the Andes, so that techniques and inven-

tions peculiar to Central America could have spread from tribe to tribe and reached the very heart of the South American continent.

The civilization of Marajó is in great part a mixture of "Andean" and "Amazonian" elements. In some ways the Marajó peoples resembled the modern Indians of Brazil and Guiana; in others they were similar to the semicivilized Indians of Colombia, whom the Spanish called "gentes de razon." And the region where this meeting of different civilizations could have occurred is precisely either at the Equator or in Colombia. Brazil and Colombia have been in direct contact with tropical cultures far more than has Peru. It was easy for moutaineers to penetrate the Amazonian jungle, just as it was easy for the "savages" of the forest to invade the cold lands because of the valleys that led to the high plateaus. The hybrid nature of the ancient Colombian cultures doubtless enhanced the ability of these emigrants to adapt themselves to the tropical environment.

The influence that Andean civilizations exerted upon the barbarians living east of their domain is somewhat the consequence of very active commercial relations. The inhabitants of the high plateaus needed parrot plumes with which to adorn themselves; they also required resin, wax, hard wood, and bamboo for their industries as well as medicinal herbs for their sick. The "savages of the forest" were the only ones who could supply them. Even today the Quechua Indians come down from their mountains in order to procure these same products. In exchange, the forest Indians were given metal objects. The gold that the Spanish and German conquistadors found in such large quantities among the coastal tribes of Venezuela and Colombia came from the Antioquia region via two commercial routes, one of which followed the course of the Meta and the other the southern slopes of the Venezuelan Cordillera.

In 1501 a Portuguese sailor on the Brazilian coast acquired a bronze ax. When Solis and Cabot came to Río de la Plata, the numerous objects in silver and even in gold that the Indians possessed proved to be their first clue that there existed toward the west a region rich in metals. The words "Río de la Plata" and "Argentine" perpetuate for all time the memory of the commerce in metals which originated in ancient Peru.

At the same time that necklaces, bracelets, pectoral plaques, and diadems in gold and silver reached the Indians of the Amazon and of Paraguay, jumbled accounts were also heard of the Inca Empire. Even before Pizzaro disembarked at Peru, the Spaniards, who were preparing to cross the Chaco deserts, had heard, on the banks of the Río Paraguay,

of a mountain people who lived in stone huts, wore long garments, and had domesticated "long-haired deer" (llamas and alpacas). The Guarani who told them these tales informed the Spaniards that this marvelous country was subject to "Candire, who was the lord of true metal and of all good things." Similarly, Orellana, during his famous trip down the Amazon, collected fabulous tales about the Inca Empire, even among tribes located on the lower stream of the great American River.

The exaggerations with which the Indians embellished their description of the Inca Empire or the Chibcha kingdoms, the confusions that arose because of their ignorance of the language, resulted in the birth of the Eldorado myth which stimulated the Spaniards irresistibly and led them into incredible adventures in the heart of the great Amazonian forest. Once Peru was discovered, the conquistadors identified the source of this wealth, described to them by the natives, not with the Inca Empire, which they conquered, but with a fabulous kingdom, El Paititi or El Gran Mojo, located somewhere east of the Andes. It was not until the seventeenth century, when the Jesuits penetrated into the heart of the Amazonian forest, that the Spaniards renounced their pursuit of this mirage.

Today the supply of metal is exhausted, yet the consequences of the commercial relations between the moutain peoples and those of the forest are still perceptible. The influence of the old Andean civilizations is evident in forms of art, in certain ornaments, and in customs and myths that have been tenaciously preserved among Amazonian tribes even though these disappeared from their place of origin four centuries ago.

THE TROPICAL FOREST AND CIVILIZATION

The hypothesis of a migration starting from the Andean region explains the advent, in the midst of a tropical jungle, of a relatively advanced civilization; but the decline and disappearance of this civilization after a few centuries raise problems whose scope greatly surpasses the framework of American prehistory. It is a temptation to use the presence of barbaric tribes as an explanation for the end of the Marajó civilization. But archeological findings point to a gradual decadence, not to the supplanting of one culture by another. When Indian tribes of the historical period were scattered over the ancient territory of Marajó, its inhabitants had disappeared or were scarcely different from their less civilized

neighbors. What affliction, then, caused this civilization of the tropics to perish? For archeologists who, thanks to their patience, were able to resurrect the history of Marajó, the answer to this question is devoid of even the slightest doubt: the Marajó civilization died because, in its initial form, it could not survive in the environment in which it had been established.

The reaction of historians and anthropologists to a naïve geographical determinism has often led them, in their interpretation of the facts, to neglect the limitations of the environment. This is notably the case in regard to the humid tropics. The large equatorial forest is scarcely propitious for the development of a civilization. Contrary to a widespread illusion, the luxuriant tropical vegetation is spread over a soil that can nourish only a sparse population. Whenever the forest yields space to food-producing cultures, the soil, alternately washed by the rains and dried by the sun, loses its thin layer of humus as well as the chemical substances that insure its fertility. After a certain number of years the fields wrested from the forest have to be abandoned. The agriculturalists then turn to yet another wooded area and clear it with their axes. The fallen trees are then burned. The new "garden" thus achieved will in turn be abandoned until, after ten or twenty years, when the natural vegetation has been reconstituted, it can again be developed. This system, admirably described by Pierre Gounou,[2] "shows great care in respecting the balance of nature as well as the intention of disturbing as little as possible the slow and delicate processes by which the soil is able to hold up and preserve its fertility under the difficult conditions occasioned by the tropical climate."

Societies that practice this type of agriculture are characterized by a low demographic density and a certain nomadism. Because the agricultural yield is scant and because there are a good many fallow fields, vast areas have to be cultivated in order to meet the demands of the inhabitants. If the soil is cultivated too intensely, the balance between the population and the natural resources is upset. Farmers have either to seek new lands or to resign themselves to vegetating on decreasingly fertile ones.

Such was doubtless the fate of the mysterious Indian tribe that settled at the mouth of the Amazon. In the beginning it must have been a large tribe—the size of the mounds they built testify to this—but its

2. *Les Pays tropicaux* (Paris: Presses Universitaires, 1953), p. 36.

prosperity did not endure more than a few generations. After it had cleared the virgin forests on its territory, it was reduced to cultivating an impoverished soil until the moment when, food resources having become scarce, the very foundation of its civilization was affected. Lacking a surplus production, it could no longer continue its specialization in crafts. The result was a rapid deterioration in ceramic art. The decoration on the urns collected from more recent sites is coarse in comparison to that which graces earlier finds. Generalized poverty must also have leveled the social classes and transformed a hierarchized society into communities with undifferentiated structures. In short, the Marajó civilization tended increasingly to resemble that of the Indian tribes whom the Portuguese killed off during the seventeenth century.

The fate of this civilization reminds us somewhat of that of the ancient Mayan Empire in the tropical plains of Guatemala. Having shone brilliantly for several centuries, it disappeared mysteriously during the sixth century A.D.; the relinquishment of its sites cannot be explained by invasions, civil wars, or epidemics. It seems that the end of the ancient Mayan Empire coincided with the total exhaustion of its soil. When arable land was too remote from urban centers, the population had to abandon the sites in order to settle in regions where it was easier to provide the necessary food.

The example of the island of Marajó illustrates once again the harmful influence which the poverty of tropical soil exerts upon the development of any somewhat complex civilization. To be sure, there were brilliant civilizations in Asia which prospered in a tropical environment, but we must not forget that these civilizations were initially established in other climates and that they occupied warm and damp areas very gradually. Moreover, in the inundated rice fields they possessed an economic foundation which the native populations of America and Africa never knew. The peoples of the Amazon who practiced an itinerant agriculture by clearing the forests probably achieved a level of civilization compatible with their habitat. The proof of this is the fact that the Andean and subsequently the European populations had to adapt themselves to the Amazonian way of life and to its methods of cultivation when they settled in the same environment. In America, as elsewhere in the world, the fate of civilization in tropical countries has been and remains subject to heavy mortgages.

Robert Caussin

THE TRANSFER OF FUNCTIONS FROM MAN TO MACHINE

When he hears about automation, automatic factories, and unmanned manufacture, the worker wonders with a certain anxiety what will be his fate in an industry which is undergoing transformation and whether the trade from which he draws his livelihood today does not risk becoming useless tomorrow and leaving him without work. No doubt he has been told that the machine will never be able to replace man entirely, that there is no danger of unemployment, since new machines create new jobs, and that he will be freed of heavy labor and fatigue, thanks to the automatized factory. But these arguments are not all valid for the man whose job is eliminated or modified and who must find another situation or adapt himself to a different kind of work. It makes no difference if the over-all perspectives are reassuring—they are less so on the individual's level. The economy may continue to experience a cycle of full employment, but the individual may have to face the depressing hunt for a new job or start at the bottom in a different trade.

Translated by Wells F. Chamberlin.

To the problems of reconverting businesses there is thus added the problem of transferring and reclassifying the "liberated" labor force. This problem concerns the entire economy. In our era of accelerated progress, there is no sector of business, no trade, which we can, without deluding ourselves, imagine as being entirely "sheltered" from the consequences of an automatism which is now in the process of becoming generalized. The problem involves, to no less a degree, the individual worker who must try to orient himself toward those studies, trades, and careers in which, when the tendency of technical progress is taken into account, his aptitudes will find employment and his personality will find a way to develop.

Such is the angle from which we propose to examine briefly the problem of transferring man's functions to the machine, its effects on conditions for employment, and certain possibilities for reducing the threat which menaces the individual today.

LONG-TERM OUTLOOK

The economy is really in evolution. We may even say that it is in a permanent state of reconversion. The most modern techniques—and we are thinking of automation—are going to be applied and become generalized. We are going to see machines progressively take over the tasks of a great number of qualified and specialized workers. We did say "progressively," for we must not expect to see, as certain alarmists have thought it possible to proclaim, a sudden "unfurling" of automation which would upset the structure of society. Although technically possible right now, so radical a transformation of the world's means of production cannot be effected without the accompaniment of a financial transformation (think of the investments required), an economic transformation (think of markets and distribution facilities), and a social transformation (think of salaries, purchasing power, and ways of life).

Such changes cannot be effected without a profound evolution in people's thinking and a more or less general acceptance, which supposes in turn a revision of the individual's aspirations and motivations. Man would no longer be man if he accepted immediately and without resistance the idea of a change which affects him individually and profoundly in his mode of life. Certainly, he will adapt to the change which automation brings him. That is assured. But it is no less certain that this adaptation will require time—one generation at least, and probably more.

In what direction will this adaptation be made? In all likelihood, it will come about through integration into the more general evolution which is in progress. It has been noted, for example, along with Colin Clark, that, under the domination of mechanization, an important drift of labor had been effected from the primary or agrarian field to the secondary or industrial field and toward the tertiary field, or field of services. Agriculture in Western countries today employs probably no more than 10 per cent of the labor force, as against 70–80 per cent a hundred years ago.

Looking at this closely, we realize that, although this reduction of the agricultural population is due in part to the introduction of improved methods of work, it is essentially the result of a profound change in the way of life of the inhabitants of rural areas, which has entailed a new division of labor. In earlier years the farmer lived off his land. He baked his bread, brewed his beer, spun his wool, cut his wood, and dug marl to improve his soil. He went to market to sell his butter, eggs, fowl, wheat, and the cattle he had raised. Today the farmer no longer goes to market. The baker and brewer deliver bread and beer to him. Industry supplies building materials, fuel, and fertilizers. A co-operative picks up his milk; another co-operative sells his crops. A large number of secondary and tertiary businesses have sprung in this way from agriculture. Freed of a multitude of cares and accessory activities, today's farmer, one might almost say, carries on farming in its pure state.

Shall we someday witness an analogous drift from the secondary phase to the tertiary phase? Shall we see industry carried on in its pure state? This evolution is already being outlined. Do we not already see many examples of it around us? We have electrical distributing companies which are distinct from the producing companies, specialized bureaus for studies and calculations, legal, fiscal, and accounting councils which free industrial firms, sales agencies, export houses, transport firms, advertising agencies. It was reported recently that the oil refineries grouped around the Étang de Berre have thought it profitable, although they belong to different companies, to establish a common maintenance service for their equipment, having the appropriate tools and stock of repair parts.

Toward whatever area of business we may turn we see this tendency toward specialization becoming stronger and developing from day to

day. Why is there this movement? Because the new division of labor allows a better development and a better utilization of particular skills by concentrating the identical operations to be performed. Automation falls in line with this evolution, which, as we can foresee, will become increasingly important. We shall see specialized service networks of more or less independent subcontractors being established around the big production units. The tertiary phase will thus free the secondary phase of a large number of extra activities.

SHORT-TERM OUTLOOK IN INDUSTRY

The evolution will also appear in the immediate future. In the next ten years we shall see—under the stimulus of an accelerated technical knowledge and of automation in particular—a considerable effort at adaptation on the part of a vast majority of businesses, large and small. How will this effort—which, we must emphasize, will be only the first wave of a deeper transformation—be shown? What will its scope be? In what fields will it be particularly noticeable?

1. If we consider the different fields of industry, it is obvious that progress will not be simultaneous or of the same scope within every branch. Mass manufactures of non-personal products, in which the production process is continuous or highly repetitious, lend themselves better than others to the application of automation techniques. On the other hand, unit or occasional manufactures and those in which setup operations must be conducted on the site (shipbuilding, building construction, etc.) appear to lend themselves less well to extensive automatization.

2. If we consider next those businesses which are already heavily automatized or are likely to become so (oil refineries, electric-generating plants, automobile plants, rolling mills, etc.), let us not allow ourselves to be impressed by such terms as "push-button factory" and other expressions which are in style. Let us look at reality. We see that these factories are only elements, fragments of important enterprises, partial installations, and that, alongside of certain automatized production services, we find others which are not automatized. And, above all, there are numerous services, which an important personnel force, which can never be automatized to the same extent: maintenance, sales, accounting, research services, etc. Let us take as an example a mechanical engi-

neering firm. We know that, when an estimate is made in this kind of business, a coefficient in the order of 400–500 per cent is applied to the cost of direct labor in order to account for expenses of all kinds, representing auxilliary activities. Is this not a very significant measure of the current importance of such services?

3. If we consider, finally, those activities which take place inside shops, in which automation has been the object of the most extensive applications, we observe that for certain operations the manual, human solution has been retained in preference to the automatized solution. Of course we might foresee the automatic replacement for a tool which breaks down, the mechanization of certain assembly operations, or even simply the transferring of products from one machine to another. All this is technically feasible, although at a terrific cost in complexity and investment. Consequently, there still remain operations which it is wiser, for seasons of pure return on investment, to carry out by less evolved but more economical methods.

All this means that, in the whole of the evolution which is now under way, we shall see branches of industry, departments or services, and operations which will lend themselves better to developed mechanization, to automation, alongside of a great number of fields, businesses, and workshops where only a partial automatization will be carried out because it will not be profitable to do more. Consequently, in our evaluation of the effects of automation, let us not be impressed by an overestimation of the relative importance of the numbers who will be directly affected.

OFFICE WORK

People have felt safe in saying that "the race of office workers, like that of the salesclerks, is in the process of disappearing." As far as office workers are concerned such a prediction seems, at the very least, premature. Employment figures show indeed that, in all countries, in absolute figures as well as in relative importance, the number of administrative personnel in private businesses and in public services has continued to increase. It is true that we do see in certain establishments (banks, insurance companies, public services, etc.) a marked tendency toward the mechanization of jobs of a statistical or accounting nature—bookkeeping, receipting, taking inventory, preparing statements, preparing payroll, controlling stock, etc.

When we analyze the nature of administrative work, we observe that it is essentially a matter of recording and preserving the information, of treating it, and of re-establishing it at the opportune moment in an appropriate form. Such an activity naturally lends itself to simplification and to mechanization. There is always, and this is the important point, at the beginning, a furnishing of information by men, followed by man-made decisions, and, finally, at the end of the process, there are measures which affect men. Office work is therefore essentially the utilization of relations among men and, as such, remains subject to human reactions. It is only the centralized part of this work which can be treated automatically. Automatization will be advantageous when it bears on information concerning large numbers of individuals and when it makes possible analyses which we could not undertake by manual means, namely, in those cases where the volume of information to be treated (or its complexity) is considerable. On the other hand, we do not foresee any practical possibility of treating in a mechanical way relationships which must be individually differentiated. And these are still the most numerous. Total automatization in this area is consequently not a thing of tomorrow, but inevitably it will progress.

CLERKING

As for salesclerks, whose disappearance is also being predicted—because we have seen self-service stores and the use of automatic vending machines developing—this prediction, too, seems premature. Attempts at extensive automatization have not been followed up. The work of salespeople is also an action on people. As the needs and desires of men are extended, and as the means of satisfying them are developed, we are also witnessing the development of buyers' information, of possibilities of choice, and of the service personnel which accompany the sale. Markets are being extended, and classes of consumers who a few years ago appeared to be unreachable, owing perhaps to their more or less primitive way of life or to their distance from the large centers, must be considered as prospects today. Sales could certainly be automatized insofar as mass, non-personal goods, and goods well known to the public are concerned. The action of selling consists essentially in information for the customer concerning the service which the product can give him and, reciprocally, in information for the producer and the distributor about the customer's real needs. Here again it is the principle of informa-

tion which is involved, and we can expect important developments of automatization in this field, thanks to the perfecting of information techniques (advertising, press, radio, television, etc.) which has already been achieved.

But selling is not all there is to distribution. Functions concerning the grouping and selecting of merchandise, keeping it in good condition, maintaining it in stock, and concerning transportation, handling, and delivery, are also part of it, as well as functions concerning the study of markets, distribution networks, credits, and collections. These are all areas in which partial, fragmentary mechanizations can be envisaged but in which, for the moment, we do not yet see any indication of a generalization of the tendency. Again, it is the centralized operations, above all, which will lend themselves to an economical and effective automatization. Now in many cases the service given by offices and stores is so occasional in regard to the consumer, beneficiary, or dependent that the latter cannot think of it as anything other than the individual solution of a personal, special case. And, moreover, he refuses to yield to an automatized routine because this often has the effect of transferring to him a part of the functions which have to be done.

However, we may reasonably expect that in the fields of administration and distribution new subdivisions of labor will be forthcoming, as they have been brought about in agriculture and in industry, and that certain activities thus detached from the present mass of tasks may lend themselves more to automatization. But, here again, total automatization is not for tomorrow.

EFFECTS OF AUTOMATION ON WORKERS

The analysis shows that all this should reassure us to a certain extent. Of course automation will eliminate entire fields of activity, businesses which will be unable to adapt, partial tasks, and, finally, jobs. But has not the same thing been true of all progress throughout history? If we feel today a strong drive in this direction, we must tell ourselves that it will not have, in the immediate future, that character of suddenness and generality which certain people take pleasure in prophesying. Its scope will not be of an extent such that it must terrorize us. Everything appears to indicate that we shall see in the next few years a following-up of the already manifested phenomenon of change in functions—a more pronounced specialization of certain current professions giving birth to

new activities, new trades, new businesses. We shall also see the creation of new products and of new fabrications still unsuspected today.

As those are essentially problems of adaptation, it is particularly important that the search for solutions not be hindered by a priori stands or by blocking of imperative requirements, which can only impede the evolution by removing the necessary fluidity from the factors now working.

RECONVERSION IN THE JOB

From the point of view which concerns us, and in view of the large outlines of this evolution, there is a certain interest in examining step by step the manner in which it affects employment.

1. On the general level there are two main observations: on the one hand, a greater and greater volume of needs, requiring more and more workers (the outlook for a general short supply of labor); on the other, a drift of activities toward the tertiary phase.

2. On the level of business establishments, there is also a two-way motion: on the one hand, a concentration of activities of the same nature in vast production units, favorable to large production in series and to automatization; on the other, the development of numerous satellite enterprises, less important, specializing in order to help the others as suppliers, subcontractors, finishers, distributors, etc.

3. Inside business firms, the double phenomenon again: on the one hand, a reduction of personnel forces occupied in production properly so called; on the other, the growth of services of research, preparation, maintenance, advertising, sales, service, etc.

4. Finally, on the working-site level, again a double aspect: on the one hand, elimination of heavy labor, routine tasks, and tasks of pure repetition; on the other, the utilization of the essential tasks of intelligence, judgment, and decision.

No doubt this schematic chart shows exceptions. The evolution does not appear everywhere, at the same time, or at the same speed. Certain branches of industry are in progress; others have a less favorable outlook. The general pace of the movement appears, however, to be quite sharply defined. On the *quantitative* level, according to fields and to activities, there is a tendency toward increase or decrease of the work-

ing personnel. On the *qualitative* level there is division, simplification, and mechanization of the repetitive tasks and at the same time a more selective specialization for tasks involving decision. There we have the first indication of the distinctions to be made in examining the problems of employment.

TRANSFORMATION OF TRADES

Leaving the general aspects of the evolution and concentrating on the more particular area of production, we pick up other indications. The progressive transformation of human activities and the passing from manual work to automatic work have had the effect of eliminating, in order, physical effort, through the introduction of the machine; mental effort, through the division of labor; and, finally, the effort of will, of decision, by the advent of automatism.

In its broad outlines, the evolution is the following:

1. The artisan, an independent worker who practices a manual trade, must do absolutely everything—establish his program, organize, buy, manufacture, sell, and keep his accounts. He must be fitted for all functions.

2. The worker who plies his trade in a shop with the help of tools or of a multiple-purpose machine does nothing more than fabricate. At the very most, he can still arrange his work in his own way.

3. The operator of a special machine usually is no longer the master of the whole of his work. He has become a "specialized hand." He can accomplish a certain spread of operations, but most of the factors, and liaison with preceding and following operations, escape him.

4. The specialist in charge of an entirely automatic machine has nothing more than a surveillance responsibility. He obeys a simple command or order: to watch a given dial or a given graphic recorder, to turn a certain wheel in order to correct such and such a deviation, and, in case of emergency, to stop the setup and call in the repair crew.

Thus it is obvious that, as the work becomes specialized, mechanized, automatized, man sees his field of intervention shrinking. Is it not to be feared that by being progressively dispossessed of his functions, with certain of his prerogatives cut away from him, he may soon become incapable of anything but a compartmentalized task, closely confined,

limited to observing a simple work order? We do not think so, but the question is worthy of examination.

FROM THOUGHT TO ACTION

Let us immediately remove one basic worry. In inventing and building machines, have our engineers really transferred human functions to men? On the physical level, yes, undeniably. The machine amplifies our strength and guides or gives precision to our gestures and our movements. But on the psychic level? Is the machine from now on gifted with faculties of attention, preception, memory, choice, and will? No doubt this appears to be so. But suppose we look at it closely; let us analyze any given human activity. Incessantly, thought intervenes to give precision to the intent—the purpose of the work. It intervenes in order to perceive a thousand bits of information, to effect innumerable and careful selections and co-ordinations, to decide finally about the motion to be made—the moment when and the place where it must be made. We are so accustomed to this, so habituated, that we no longer consider all this mental process which leads from thought to action. With the help of habit, our decisions seem to come from nothing other than our subconscious.

But, when we want to have this action reproduced by the machine, we must admit that the machine has no subconscious and that, with it, we cannot leap from the idea to the act. When we try, in order to relieve ourselves of our intervening in the work, to pass from brain to machine, we must concern ourselves with giving the machine organs of control, memory organs, organs of choice and regulation, which will be substituted for our cerebral action. At that moment we have the feeling that we are rebuilding the mental process of our activities with material parts, but in reality all that we can do, through research, is to endow the machine with *physical means*—relays, mechanical devices, and electronic or other devices which will assure an analogous effect and will permit us to obtain a result similar to that of the human will. A dog on a graduated scale will stop a mechanical motion; a precisely profiled cam will determine the successive variations of the behavior of a tool; a spread of perforations or magnetic impressions will assure the calculation of complex algebraic formulas. These performances will sometimes give a convincing impression of intelligent behavior on the part of the machine. But this will never be anything more than an appear-

ance. Certainly the result obtained with the machine's help will generally be superior, in strength or in quality, to human action; but the machine will bring nothing to this action by itself. It has no will of its own, does not think, and can initiate only those steps dictated by the program which man has provided for it.

In bestowing these perfections on the machine, we avoid our need to intervene in order to solve over and over again problems which have already been solved a thousand times, and we spare ourselves additional efforts. We shall have made the machine our slave. It is going to work for us. It is going to free us in certain circumstances from having to specify the goal again each time, from having to make the choice again, and from having to decide the course of action. But it will not be able to direct, to choose and to decide, being aware of its objective, its choice, or its decision. Man therefore does not have to fear being eventually dispossessed by the machine from his noblest faculties. His brain, instead of commanding his muscles, commands other forces and other physical means, but it remains their master.

LOWER JOB QUALIFICATIONS?

Let us return to the worker. It is a fact that man's field of action is shrinking. The complete task of the artisan of former times has been split into fractions, "crumbled," to use Friedmann's expression again, and today's worker carries out only a fragment of it—sometimes a very small one. Has job qualification, formerly of necessity very broad, been raised, or has it dropped with mechanization and automatization?

Here is what they say:

The director of an electrical generating plant tells us: "Present conditions for operating almost fully automatized installations require on the part of personnel a qualification which is incontestably different from that required by the old installations."

And the general manager of an important bakery states: "The only difficulty we experienced in the automatization of our cookie factory was when we had to transform our 'pastry cooks' into 'chemist's assistants'; when we had to indicate to them that a cooking temperature is not taken by opening the oven door and putting one's head inside but by reading the indications shown on the dial of an oven thermometer; and when we had to teach them to carry out precise and constant measurements."

At Chantereine, on the new production line of mirrors, the Compagnie de Saint-Gobain states: "The very rapid evolution during the past thirty years of the glass and mirror industry, the present very technical aspect of manufacture and means of scientific control, have transformed the trade of the glassmaker, who has nothing in common with his former self. The men at Chantereine today are controllers, estimators, electronics experts, mechanics, oven supervisors, operators of tractors or traveling cranes . . . yet the glassmaker's trade has preserved its particular spirit, built upon devotion to the trade and to the sense of teamwork, and has kept its traditions."

These examples, coming from practice, show that it is certainly not quite exact to talk of lowering or of raising the specifications of job functions. What is actually happening is that certain qualities or aptitudes, on which emphasis was placed when the production was being carried out with the use of hand tools or of a multipurpose machine, have lost their relative importance today, now that this work is done by a special machine and will no longer be necessary when an entirely automatic machine is adopted. Reciprocally, as machines are equipped with accessories and with automatic organs which are more and more complex, precise, and delicate, the role of the services which must study and produce these organs, regulate them, and assure their unfailing operation assumes more importance and requires qualities which were not indispensable in the same degree earlier. On the whole, we see then that the personnel forces necessary in different services and the qualifications which are set must change in the move toward automation each time that we pass from one stage to the next, from simple tooling to the manually controlled machine, then to the special machine, and, finally, to the automatic machine. In reality each stage offers employment on different levels of technical knowledge and widens the spread of functions which must intervene.

NEW JOB QUALIFICATIONS

To become aware of that, all we need to do is to observe the types of workers who will be necessary in the automation cycle, in a branch of industry such as mechanical engineering, as well as the qualifications which will be expected of each of them. Without discussing supervisory personnel, and in the area of production alone, we see that various categories of men will be necessary:

1. *Inventors* who will create the automatic machines in laboratories and in research bureaus and who will adapt new discoveries to practice. These men will need to be of scientific mind and endowed with imagination.

2. Next *builders* will be required, capable of transferring the theoretical conceptions to the practice level. They will be mechanics, electronics experts, toolmakers, etc. In a word, they will be doers.

3. Then people capable of *operating* the machines will be needed. As this will be principally a task of surveillance, it will call for attentive minds which possess that capacity termed "expectant attention" but do not need highly developed technical knowledge.

4. There will also be *maintenance men,* capable of detecting the origin of breakdowns, diagnosing trouble, and carrying out adjustments. They will have methodical minds, given to detail, and will be men of sure judgment.

5. And then there will be the *skilled workers,* capable of doing everything that the machine will not have taken over from the workers. They will be masons, plumbers, electricians, painters, carpenters, welders, etc., whose chief activity, when they are faced with unforeseen situations involving small jobs, will be modifying equipment, choosing a proper solution, co-ordinating all its elements, and carrying the work through to a successful conclusion.

At first blush and at present among these different trades it is certainly the operating of machines—reduced essentially to a task of surveillance—which will lend itself to the easiest and most rapid beginning. This tendency is not new. The use of machines is becoming commonplace, and, aided by familiarity, everyone today knows how to use a typewriter, a radio, or a television set and how to drive a car. On the other hand, the other functions of mechanical engineering (invention, construction, maintenance, etc.) will still require for a long time special training and much longer apprenticeship. That is why it could at a certain time be said that job qualifications were going to be lowered for operating machines and raised for other functions.

SHALL WE ADAPT MEN?

No one, it seems, is seriously considering the possibility of reversing the direction of this evolution, of going upstream and suspending technical

progress. Therefore it is necessary that man, the worker, adapt himself to these new conditions. How well this adaptation be effected?

In the past we could observe—in most branches which became industrialized—that, in general, it was not the experienced artisans, possessing to the last degree a fixed manual trade, who were picked to control the machines when these were adopted but rather people having aptitudes and a taste for mechanics, "mechanicians." Later they gave way to "qualified workers," then to "specialized workers," and so on. To illustrate, we may note that the village blacksmith rarely became a garage man—it was his son or his neighbor who acquired the necessary knowledge and equipment for the new trade. In other cases technical progress appeared in a form different from mechanization properly so called, for example, by the substitution of one material for another (molded plastic pieces replacing fabricated metal pieces). The buyer is then often forced to turn to another supplier, so that, from the point of view with which we are concerned, it turns out that the work is transferred from a metal trade to a trade stemming from the chemical industry. It is therefore certainly not the same man who is called upon to adapt himself to the new method of work. In cases of this type, and when technical progress is introduced with a certain reservation, a certain slowness, the substitution is done without any apparent harm. Time facilitates things. The problem is certainly easier to solve.

But, today, the rhythm of progress has accelerated in a prodigious fashion. All industries and all trades are concerned at the same time. Most often the isolated individual cannot readapt himself or find a new job by his own means. Business, on its part, cannot be unaware of the problem or be disinterested in it. It finds itself faced with the alternatives of using the old personnel by trying to adapt them to the new working conditions or of substituting for the former workers new personnel trained in the new methods and of then trying to reclassify the old ones within the actual enterprise or elsewhere. Whether it is adaptation or substitution, the option to be exercised deserves thought, for neither economic calculation nor the social implication can give the right solution by itself. Individual psychological factors must also be taken into account.

PSYCHOLOGICAL FACTORS

It is when we try to transfer a man from one category of work to the next, whether it is up or down, that we trigger a painful reaction in

him and that we give him a feeling of frustration. When we want to intrust a more mechanized task to him than the one he had before, but in which initiative and responsibility are more limited, he feels that he is being downgraded for two reasons. He finds himself before a machine he does not know and on which he must do an apprenticeship (with all the groping and risk of error which that implies)—and, consequently, he has fears of not measuring up. On the other hand, he feels that his professional knowledge, his experience acquired in the former method of work, are no longer useful and are even a handicap for him. When we want to give him a less mechanized job, he also has a feeling of being downgraded. He must take up accessory tasks for which he was assisted by human or by mechanical helpers. Of necessity he finds himself awkward in executing these minor tasks which he has not been trained to do; and, on the other hand, in the work itself, he can no longer show the mastery which he had of the perfected machine. Consequently, no matter how it is done, the sense of downgrading persists.

This is true unless the character of the person involved pushes him to interest himself actively in the utilization of more complicated means of action, to a widening of his field of initiative and responsibility, or to considering as a challenge the need to execute a task with more rudimentary means than those to which he was accustomed. If he is curious about new methods, likes innovations, if he is ambitious, if he considers that he is enriching himself intellectually in training himself in new procedures, everything is perfect. When these psychic conditions are combined in an individual, there is no problem, or it is a simple one. When these conditions do not exist, it is important to cause them to arise through preparation, through the appropriate psychological action, before effecting the planned transfer. However, it seems undeniably simpler, when a worker (for reasons of character or of age) feels some repugnance in facing such a change, to limit ourselves to a lateral transfer, avoiding making the person take a new step on the path to mechanization or automatization.

NEW ORIENTATION

However, it is a good idea not to underestimate the faculties of adaptation in man. Before any decision, we must consider means of helping the worker and of showing him the way by which he will reach those better conditions of life which we promise him under automation.

What can we do for the man whose job, because of technical progress, requires different qualifications from now on? Three things can be done; there are three ways open. We can give him the new training necessary for him to evolve with the trade or with the technique of the branch concerned. We can, if he has the desired qualities of intellect, morale, and character, think in terms of promotion and train him for a job involving greater responsibility. We can also, as we have said, consider lateral changes, or transfers, favoring the utilization of what he has acquired earlier.

Each of these possibilities requires an individual professional orientation test, or, rather, reorientation test; training, based both on the aptitudes of the individual and on the qualifications of the job which are to be met; and, finally, an effort on the individual's part to study and to acquire training in the new functions. The whole of this action of "reclassification"—a word we do not like because it suggests the idea of a mechanical treatment, whereas the problem is first of all a social one, a problem of human mutual aid—suggests certain considerations which will bring us to our conclusion.

1. Having the worker evolve along with the technical evolution of the trade is a solution which is primarily valid for the young. Young workers and future workers must be started off not in today's trades but in those of tomorrow. They must all be instructed and must all continue their learning without interruption, in order to evolve with the technique of their branch of industry. This training is as indispensable as research. Business leaders must keep an eye on it if they do not want in ten or fifteen years to have their personnel making up a team of "oldsters," or workers definitely outmoded.

2. Training for promotion of those who have the necessary stuff for it means the fruitful utilization of the technical acquisition and the experience of the trade and of the men, of their spirit of devotion to their trade, and of the sense of teamwork, to which the directors of Saint-Gobain refer. This is a precious asset which we must take care not to waste or disperse.

3. Carrying out transfers, or lateral changes, is often the advisable solution when men no longer have youth's zeal for learning and do not appear fitted for commanding their companions. Such transfers will be facilitated if we refer not to the trade as a whole but to the factors

of which the qualification for the job is composed: knowledge of the material, knowledge of the machines, knowledge of the procedures, and individual aptitudes.

DIRECTION OF THE EVOLUTION

And this brings us to a final consideration, which is valid for all cases. The evolution of manufacturing assumes constantly different aspects. When we say that one of today's trades no longer has anything in common with that of former times, we mean that its center of gravity has shifted. Yesterday the emphasis was placed on the treatment of the material; today it is carried over to the functioning of the machine.

Automation, in that respect, has sparked a remarkable phenomenon—the control operations of machines have become practically identical in very dissimilar industries. Whether in a cookie factory, a glassworks, or the chemical industries, the operations of feeding, mixing, and of controlling the ovens are made up of analogous elements. They are reduced to the reading of dials, to the detection of deviations, to corrections by turning a wheel. They require identical qualities: vigilant attention, ability to recognize anomalies, cool-headedness, sensitivity in maneuvering, and a sense of responsibility. The pastry cook, the glassmaker, and the chemist of yesterday have all become "controllers, oven operators, tractor and crane operators," and, as such, they are closely related to the men in the electric-generating plants and in the oil refineries. These trades, which are tomorrow's trades, are found in many branches of industry. They have become "multivalent." One senses very clearly that men who yesterday were working in steel, glass, or wood are qualifying today as machine operators or special equipment operators and will be qualified tomorrow as planners, estimators, controllers, adjusters, etc. Their functions will no longer be based on the properties of the material or of the machine but on aptitudes and on *human qualities.*

That observation, if it raises many hopes within us, also shows us the way in which the movement will be oriented—this movement of which the present phase has been called "the relieving of man by the machine." We must say to ourselves that the new work which automation offers us (there is no point in deluding ourselves—automation will not bring us the elimination of work) is opportunity knocking on our door. As Phil Carrol, president of the Society for the Advancement of Management, said recently: "We have no choice. We must prepare for tomor-

row. We must study, study all the time, in order to get where we want to be before the end of the forty short years of active life which are granted us. We have no choice, unless it is that of learning more in order to do our present jobs as well as we can do them, and of learning still more in order to deserve the promotions we want." We shall add only one word to that. We must see to it that others are made to study and made to advance so that they may obtain their share in the progress which life is bringing us today and which it holds in store for us tomorrow.

HUMAN ASPIRATIONS

A final question to serve as conclusion. The worker of today is going to become tomorrow's technician. He is going to learn more, to be started on new techniques, sometimes in order to prepare himself for promotion, but most often simply in order to keep his place on the job. Will extra learning and professional training bring him "joy in work"? In the past, work has been considered too much as something outside life, a test, a curse, a subjugation from which one had to free one's self. We sought to remove physical effort from work, then mental effort, and now we are seeking to eliminate the effort of decision, the effort of will. The man who has almost nothing to say in his work cannot be happy. Since we take from him the satisfaction of "correctly deciding" when faced with new problems, he seeks outside of work what have been called "possibilities of escape." But it is really much more, and we prefer to say that he is seeking "possibilities of expression." What makes the personality of a human being is precisely his individual way of expressing what is in him, what he feels deeply, what he experiences. It is the possibility of re-establishing around himself, in his own way, with his own personal imprint, those events and facts which other men have taught him. Why are sports, automobiles, travel, television, puttering, "do-it-yourself" projects, hobbies, contests, etc., so successful? Because to a certain extent they bring man the chance to satisfy this aspiration for personal expression, or, at the very least, because they provide him with moments of escape which have become necessary to him in the absence of the happiness and the joy he no longer finds in his work. In an individual effort for personal culture he will be able to find once again the possibilities of expression of which he is deprived today. But these possibilities must be shown him, the rudiments of an initia-

tion in the various forms of culture must be given him, in order to allow him to choose those which correspond to his own temperament and which will help him become a complete man again.

And there is the basic problem to which we must finally return. If automatization has stripped the worker of prerogatives which he formerly possessed when he practiced a complete trade, it must in return restore to him his role in the life of the society. The error of the past was not in specializing men in their work—that was a tendency which could not be avoided—but in the specializing and compartmentalizing of their way of life as a function of work. Today's general concern must be to prepare man for all his tasks—not only for his task as worker, through professional training, but also for his task as consumer through education in family and household arts, for his role as an owner of durable goods through training in economics, for his role as citizen through civic and social education, for the exercise of his faculties as a man of culture through training in thought and in the expression of that thought. Worker, consumer, owner, citizen, intellectual—he is still the same man. Every man must be all of these at the same time in order to be fully a man. And we must strive to give each man access to all those aspects of life. Automation, by the effort it requires, by the wealth which it can give, and by the leisure it promises man, is the only chance which society has to bring about this sane relocation of values. It is important that society not allow the opportunity to escape.

Notes on the Contributors

JOSÉ ORTEGA Y GASSET, whose hitherto unpublished manuscript, "The Difficulty of Reading," appears in this issue, was born in Madrid in 1883 and died in 1955. In 1904 he took his doctorate at the University of Madrid with a thesis on "The Terrors of the Year One Thousand (Critique of a Legend)," then studied Neo-Kantian philosophy in Leipzig, Berlin, and Marburg for two years, and from 1910 to 1936 taught metaphysics at the University of Madrid. In 1902 he began his collaboration with journals and reviews and in 1914 published the first of his books, which, together with his lectures, political thought, and editorial work, have had a major influence in Spain and the world at large, particularly in America. In 1923 he founded the *Revista de occidente* and, in 1948, the Madrid Institute of Humanities. He lived, after 1936, in France, Holland, Argentina, and Portugal and, since 1945, maintained a permanent residence in Spain. Most important among his many published works are: *Obras completas* (6 vols.; Madrid: Revista de Occidente, 1946–47); *Meditaciones del Quijote* (Madrid: Imprenta Classica Española, 1914); *El Espectador* (Madrid: Revista de Occidente, 1916–34); *Invertebrate Spain,* trans. Mildred Adams (New York: W. W. Norton & Co., 1937); *The Dehumanization of Art, and Notes on the Novel,* trans. Helene

Weyl (Princeton, N.J.: Princeton University Press, 1948); *The Revolt of the Masses* (New York: W. W. Norton & Co., 1932); *Ensimismamiento y alteración: Meditación de la técnica* (Buenos Aires: Espasa-Calpe, 1939); and *Ideas y creencias* (Buenos Aires: Espasa-Calpe, 1940).

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